

SPARC® Enterprise

M8000 / M9000 Servers



We make sure





SPARC® Enterprise M8000/M9000 Servers Site Planning Guide

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Preface

The SPARC® Enterprise M8000/M9000 Servers Site Planning Guide provides the physical system specifications for this type of server, gives an overview of the network specifications, and explains other items that need to be considered beforehand when planning system installation. (These topics include system environment requirements that must be met for safe system migration as well as the power supply requirements.)

Carefully read this manual together with the manuals referenced.

This section explains:

- [“Glossary” on page xiii](#)
- [“Structure and Contents of This Manual” on page xiv](#)
- [“SPARC Enterprise M8000/M9000 Servers Documentation” on page xiv](#)
- [“Text Conventions” on page xvi](#)
- [“Prompt Notations” on page xvii](#)
- [“Syntax of the Command Line Interface \(CLI\)” on page xvii](#)
- [“Environment Requirements for Using This Product” on page xviii](#)
- [“Conventions for Alert Messages” on page xix](#)
- [“Notes on Safety” on page xx](#)
- [“Alert Labels” on page xxiii](#)
- [“Product Handling” on page xxvi](#)
- [“Fujitsu Siemens Computers Welcomes Your Comments” on page xxviii](#)

Glossary

For the terms used in the [“SPARC Enterprise M8000/M9000 Servers Documentation” on page xiv](#), refer to the *SPARC Enterprise M4000/M5000/M8000/M9000 Servers Glossary*.

Structure and Contents of This Manual

This manual is organized as described below:

- [Chapter 1](#) Physical Specification
This chapter provides the physical system specifications for SPARC Enterprise M8000/M9000 servers.
- [Chapter 2](#) Network Connection Specifications
This chapter provides the network connection specifications of the SPARC Enterprise M8000/M9000 servers.
- [Chapter 3](#) Environmental and Electrical Specifications
This chapter describes the system environment requirements that must be met for safe system migration, as well as the power supply requirements, for SPARC Enterprise M8000/M9000 servers.
- [Abbreviations](#)
Provides the full spellings of abbreviations used in this manual.
- [Index](#)
Provides keywords and corresponding reference page numbers so that the reader can easily search for items in this manual as necessary.

SPARC Enterprise M8000/M9000 Servers Documentation

Book Title	Order No.
SPARC Enterprise M8000/M9000 Servers Site Planning Guide	U41685-J-Z816-x-76
SPARC Enterprise Equipment Rack Mounting Guide	U41711-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Getting Started Guide	U41717-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Overview Guide	U41686-J-Z816-x-76
Important Safety Information for Hardware Systems	U41715-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Safety and Compliance Guide	U41687-J-Z816-x-76
External I/O Expansion Unit Safety and Compliance Guide	U41716-J-Z816-x-76

Book Title	Order No.
SPARC Enterprise M8000/M9000 Servers Unpacking Guide	U41718-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Installation Guide	U41688-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Service Manual	U41689-J-Z816-x-76
External I/O Expansion Unit Installation and Service Manual	U41679-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers RCI Build Procedure	U41695-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers Administration Guide	U41680-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF User's Guide	U41681-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers XSCF Reference Manual	U41682-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers Dynamic Reconfiguration (DR) User's Guide	U41684-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers Capacity on Demand (COD) User's Guide	U41693-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers RCI User's Guide	U41694-J-Z816-x-76
SPARC Enterprise M8000/M9000 Servers Product Notes	Go to the Web
External I/O Expansion Unit Product Notes	U41740-J-Z816-x-76
SPARC Enterprise Server UPC Connector Supplement	U41794-J-Z816-x-76
SPARC Enterprise M4000/M5000/M8000/M9000 Servers Glossary	U41791-J-Z816-x-76

Note – “x” in the order number is the version number of the manual.

1. Manuals on the Web

The latest versions of all the SPARC Enterprise Series manuals are available at the following website:

<http://manuals.fujitsu-siemens.com/>

2. Manual (man page) provided in the system

XSCF man page

Note – The man page can be referenced on the XSCF shell, and it provides the same content as the *XSCF Reference Manual* for your server.

Text Conventions

This manual uses the following fonts and symbols to express specific types of information.

Fonts/symbols	Meaning	Example
AaBbCc123	What you type, when contrasted with on-screen computer output. This font represents the example of command input in the frame.	XSCF> adduser jsmith
AaBbCc123	The names of commands, files, and directories; on-screen computer output. This font represents the example of command input in the frame.	XSCF> showuser -P User Name: jsmith Privileges: useradm auditadm
<i>Italic</i>	Indicates the name of a reference manual	See the <i>XSCF User's Guide</i> for your server.
" "	Indicates names of chapters, sections, items, buttons, or menus	See Chapter 2, "Preparation for Installation."

Prompt Notations

The following prompt notations are used in this manual.

Shell	Prompt Notations
XSCF	XSCF>
C shell	machine-name%
C shell super user	machine-name#
Bourne shell and Korn shell	\$
Bourne shell and Korn shell super user	#
OpenBoot PROM	ok

Syntax of the Command Line Interface (CLI)

The command syntax is as follows:

- A variable that requires input of a value must be enclosed in <>.
- An optional element must be enclosed in [].
- A group of options for an optional keyword must be enclosed in [] and delimited by |.
- A group of options for a mandatory keyword must be enclosed in {} and delimited by |.
- The command syntax is shown in a box.

Example:

XSCF> **showuser -a**

Environment Requirements for Using This Product

This product is a computer that is intended to be used in a computer room.

Conventions for Alert Messages

This manual uses the following conventions to show alert messages, which are intended to prevent injury to the user or bystanders as well as property damage, and important messages that are useful to the user.

WARNING:

This indicates a hazardous situation that could result in death or serious personal injury (potential hazard) if the user does not perform the procedure correctly.

CAUTION:

This indicates a hazardous situation that could result in minor or moderate personal injury if the user does not perform the procedure correctly. This signal also indicates that damage to the product or other property may occur if the user does not perform the procedure correctly.

IMPORTANT:

This indicates information that could help the user to use the product more effectively.

Alert Messages in the Text

An alert message in the text consists of a signal indicating an alert level followed by an alert statement. Alert messages are indented to distinguish them from regular text. Also, a space of one line precedes and follows an alert statement.

WARNING:

The tasks listed below for this product and optional product provided by Fujitsu Siemens Computers should be performed only by authorized service personnel.

The user must not perform these tasks. Incorrect operation of these tasks may cause electric shock, injury, or fire.

- Installation and reinstallation of all components
- Removal of front, rear, or side covers
- Mounting/unmounting of optional internal devices
- Connecting/disconnecting of external interface cables
- Maintenance (repair and regular diagnosis and maintenance)

Also, important alert messages are shown in [“Important Alert Messages” on page xx](#).

Notes on Safety

Important Alert Messages

This manual provides the following important alert signals:



Caution – The WARNING signal indicates a dangerous situation could result in death or serious injury if the user does not perform the procedure correctly.

Task	Warning
Normal operation	Electric shock, fire Do not damage, break, or modify the power cables. Cable damage may cause electric shock or fire.



Caution – The CAUTION signal indicates a hazardous situation could result in minor or moderate personal injury if the user does not perform the procedure correctly. This signal also indicates that damage to the product or other property may occur if the user does not perform the procedure correctly.

Task	Warning
Normal operation	<p>Equipment damage</p> <p>Be sure to follow the precautions below when installing the main unit. Otherwise, the equipment may be damaged.</p> <ul style="list-style-type: none">• Do not block ventilation slits.• Avoid installing the equipment in a place exposed to direct sunlight or near equipment that becomes extremely hot.• Avoid installing the equipment in a dusty place or a place directly exposed to corrosive gas or salty air.• Avoid installing the equipment in a place exposed to strong vibration. Also, install the equipment on a level surface so that it is stable.• The grounding wire must be class 3 or higher. Connecting it with another grounding wire for shared grounding may cause a malfunction. Be sure to use a single grounding path for the grounding wire.• Do not run any cable beneath any equipment. Also, prevent cables from becoming taut. Never disconnect any power cable from the equipment while power is being supplied to the equipment.• Do not place anything on top of the main unit. Do not use the main unit as a workspace.• Avoid exposing the equipment to rapid changes in the ambient temperature, such as a rapid increase during transport in winter. A rapid increase in the ambient temperature causes moisture to condense in the equipment. Use the equipment only after the difference between its temperature and the ambient temperature is negligible.• Avoid installing the equipment near a copy machine, air conditioner, or welding machine, which is noisy.• Take preventive action to minimize static electricity at the installation location. Note that static electricity is easily generated in some carpets and can cause the equipment to malfunction.• Confirm that the power supply voltage and frequency during operation match the rated values indicated on the equipment.• Do not insert any object into an opening in the equipment. Components inside the equipment use high voltage. Conductive foreign matter, such as a metal object, inserted into the equipment, may cause a short circuit between components, resulting in fire, electric shock, or equipment damage.• For maintenance of the equipment, contact your authorized service personnel.

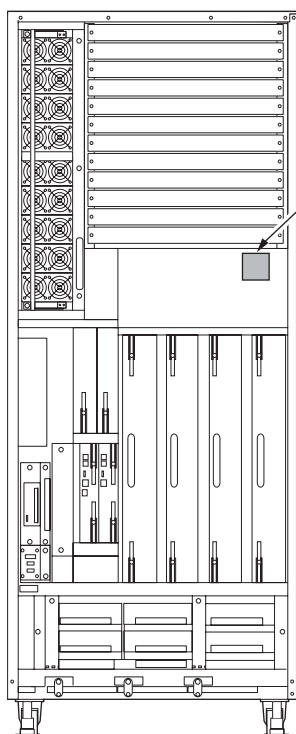
Task	Warning
Normal operation	<p>Data destruction</p> <p>Confirm the items listed below before turning off the power. Otherwise, data may be destroyed.</p> <ul style="list-style-type: none"> • All applications have completed processing. • No user is using the equipment. • When the main unit power is turned off, the Power LED on the operation panel is turned off. Be sure to confirm that the Power LED is off before turning off the main power (uninterruptible power supply [UPS], power distribution box, main line switch, etc.). <p>If necessary, back up files before turning off the system power.</p> <p>Data destruction</p> <p>Do not forcibly stop a domain that is operating normally. Otherwise, data may be destroyed.</p> <p>Data destruction</p> <p>Do not disconnect the power cable from the AC power input while power is being supplied. Otherwise, data stored on hard disk units may be destroyed.</p>

Alert Labels

The labels shown below are affixed on this product. These labels provide information for users of the product:



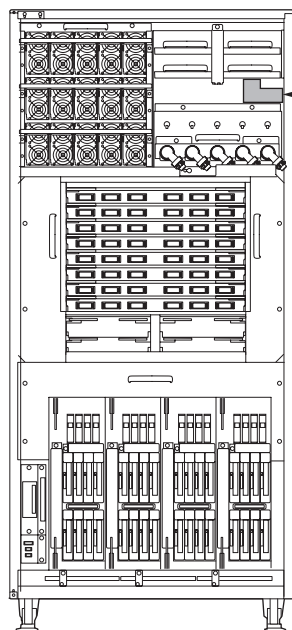
Caution – Do not peel off the labels.




⚠ 注意 CAUTION
保守時はリストストラップを着用のこと。
ELECTROSTATIC SENSITIVE DEVICES

⚠ 注意 CAUTION
感電 内部には高電圧部分があり、感電
する恐れがあります。保守担当者
以外の方は内部に触れないで下さい。
**HAZARDOUS VOLTAGE.
SERVICE ENGINEER ONLY
TOUCH THE INSIDE.**

SPARC Enterprise M8000 Server (Front View)

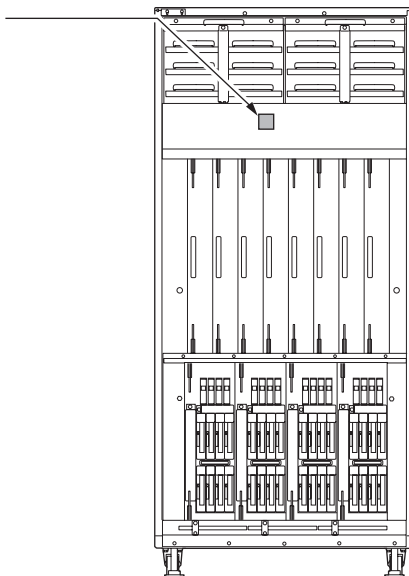


<p>⚠ 注意 CAUTION</p> <p>感電 内部には高電圧部分があり、感電する恐れがあります。 保守担当者以外の方は内部に触れないで下さい。 HAZARDOUS VOLTAGE; SERVICE ENGINEER ONLY TOUCH THE INSIDE.</p>	<p>⚠ 注意 CAUTION</p> <p>保守時はリストストラップを着用のこと。 ELECTROSTATIC SENSITIVE DEVICES</p> 
<p>⚠ 警告 WARNING</p> <p>この装置はタッチカレント(漏洩電流)が大きいため、電源接続に先立って接地接続を行ってください。 HIGH TOUCH CURRENT, EARTH CONNECTION ESSENTIAL BEFORE CONNECTING SUPPLY.</p> <p>⚠ ACHTUNG AVERTISSEMENT</p> <p>HOHER ABLEITSTROM, VOR ANSCHLUSS AN DEN VERSORNGUNGSTROMMKREIS UNBEDINGT ERDUNGSVERBINDUNG HERSTELLEN. COURANT DE FUITE ÉLEVÉ, RACCORDEMENT À LA TERRE INDISPENSABLE AVANT LE RACCORDEMENT AU RÉSEAU.</p>	<p>⚠ 警告 WARNING ACHTUNG AVERTISSEMENT</p> <p>この装置には複数の電源入力があります。感電の危険を防止する為に、保守時は全てのメインラインスイッチを切断すること。 THIS UNIT HAS MORE THAN ONE POWER SUPPLY CORD, TURN ALL MAIN LINE SWITCHES OFF BEFORE SERVICING TO AVOID ELECTRIC SHOCK. DIESES SYSTEM HAT MEHR ALS EINE NETZ-ZULEITUNG, ES MÜSSEN ALLE NETZ-ZULEITUNGEN GETRENNT WERDEN, BEVOR DAS SYSTEM GEOFFNET WIRD. CET APPAREIL A PLUSIEURS SOURCES D'ALIMENTATION, AFIN DE NE PAS VOUS ELECTROCUTER, DEBRANCHEZ TOUS LES DISJONCTEURS AVANT L'ENTRETIEN DE L'APPAREIL.</p>

SPARC Enterprise M9000 Server (Front View)

⚠ 注意 CAUTION
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ELECTROSTATIC SENSITIVE DEVICES

⚠ 注意 CAUTION
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する恐れがあります。保守担当者
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HAZARDOUS VOLTAGE.
SERVICE ENGINEER ONLY
TOUCH THE INSIDE.



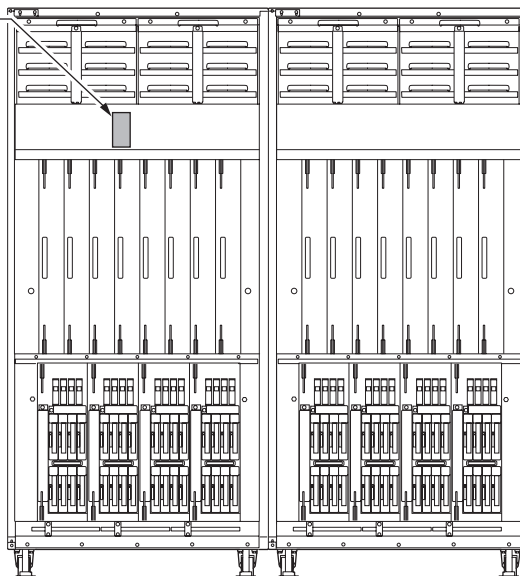
SPARC Enterprise M9000 Server (Rear View)

⚠ 注意 CAUTION
保守時はリストストラップを着用のこと。
ELECTROSTATIC SENSITIVE DEVICES

⚠ 注意 CAUTION
感電 内部には高電圧部分があり、感電する恐れがあります。保守担当者以外の方は内部に触れないで下さい。
**HAZARDOUS VOLTAGE.
SERVICE ENGINEER ONLY
TOUCH THE INSIDE.**

⚠ 注意 CAUTION
この装置を増設する前にマニュアルを参照して下さい。
**SEE INSTALLATION INSTRUCTION(S)
BEFORE INSTALLING THE PRODUCT.**

⚠ ACHTUNG ATTENTION
LESEN SIE VOR DER INSTALLATION DIE
INSTALLATIONSANWEISUNG DURCH.
CONSULTEZ LA NOTICE AVANT
D'INSTALLER CET APPAREIL.



SPARC Enterprise M9000 Server with Expansion Cabinet (Rear View)

Product Handling

Maintenance



Caution – Certain tasks in this manual should only be performed by a certified service engineer. User must not perform these tasks. Incorrect operation of these tasks may cause electric shock, injury, or fire.

- Installation and reinstallation of all components, and initial settings
- Removal of front, rear, or side covers
- Mounting/de-mounting of optional internal devices



- Plugging or unplugging of external interface cards
- Maintenance and inspections (repairing, and regular diagnosis and maintenance)

Caution – The following tasks regarding this product and the optional products provided from Fujitsu Siemens Computers should only be performed by a certified service engineer. Users must not perform these tasks. Incorrect operation of these tasks may cause malfunction.

- Unpacking optional adapters and such packages delivered to the users
- Plugging or unplugging of external interface cards

Remodeling/Rebuilding



Caution – Any modification and/or recycling of this product and its components may be carried out only by a certified service engineer and must not be done by the customer under any circumstances. Otherwise, electric shock, injury or fire may result.

Emission of Laser Beam (Invisible)



Caution – The main unit and high-speed optical interconnect cabinet contain modules that generate invisible laser radiation. Laser beams are generated while the equipment is operating, even if an optical cable is disconnected or a cover is removed. Do not look at any light-emitting part directly or through an optical apparatus (e.g., magnifying glass, microscope).

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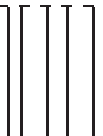
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FOLD AND TAPE

Physical Specification

This chapter describes what the reader is expected to know, including physical specification for the SPARC® Enterprise M8000/M9000 servers, before planning server installation.

This chapter contains the following sections:

- [Section 1.1, “Before Setting Up the System” on page 1-1](#)
- [Section 1.2, “Physical Specifications” on page 1-4](#)

1.1 Before Setting Up the System

Before starting server installation, verify that the requirements listed in [TABLE 1-1](#) are satisfied.

TABLE 1-1 Checklist (1 of 3)

Requirements	Item	Check
System components	Have the server components been decided?	<input type="checkbox"/>
	Has the total number of servers been decided?	<input type="checkbox"/>
System management	Have the system administrators and operators taken the required Sun Microsystems or Fujitsu training courses?	<input type="checkbox"/>

TABLE 1-1 Checklist (2 of 3)

Requirements	Item	Check
Physical specifications	Has the server installation location been decided?	<input type="checkbox"/>
	Does the installation floor layout satisfy the ventilation and maintenance access requirements? See Section 1.2.2, “System Installation (Space)” on page 1-13	<input type="checkbox"/>
	Does the device layout guarantee that heated air vented from one component does not enter an air intake of another component? See Section 1.2.2, “System Installation (Space)” on page 1-13	<input type="checkbox"/>
	Does the access route provide sufficient space for transport of the packed devices? Have you confirmed that all route incline angles are within the permitted range? See Section 1.2.3, “Planning Your Access Route” on page 1-31	<input type="checkbox"/>
Planning your access route	If a pallet jack is to be used, have you confirmed that the device weight is within the load limit of the pallet jack? See Section 1.2.3, “Planning Your Access Route” on page 1-31	<input type="checkbox"/>
	If an elevator is to be used, have you confirmed that the elevator car is wide enough for the device to be carried into it and that the device weight is within the load limit of the elevator? See Section 1.2.3, “Planning Your Access Route” on page 1-31	<input type="checkbox"/>
	Have cabinet stabilization measures been considered? See Section 1.2.4, “Cabinet Stabilization Measures” on page 1-32	<input type="checkbox"/>
	Do you clearly understand what data connections and feeds are required for system startup and network connections? See CHAPTER 2, “Network Connection Specifications” on page 2-1	<input type="checkbox"/>
Network specification	Does the computer room air handling meet temperature and humidity requirements? See Section 3.1, “Environmental Requirements” on page 3-1	<input type="checkbox"/>
	Can the computer room continuously satisfy environmental requirements?	<input type="checkbox"/>
	Is the computer room adequately equipped to extinguish a fire?	<input type="checkbox"/>
	Is the computer room secured?	<input type="checkbox"/>

TABLE 1-1 Checklist (3 of 3)

Requirements	Item	Check
Facility power	Do you know the required operating voltages and electrical current levels of the device and peripherals? See Section 3.2, “Electrical Specifications” on page 3-4	<input type="checkbox"/>
	Are enough power outlets provided for the server cabinet, monitors, and peripherals?	<input type="checkbox"/>
	Are the circuit breakers for the device suitable in terms of voltage and current-carrying capacities? See Section 3.4, “Facility Power Requirements” on page 3-12	<input type="checkbox"/>
	If you use single-phase power feed, is a power outlet located within 3.0 meters (9.8 feet) of the device?	<input type="checkbox"/>

1.2 Physical Specifications

This section outlines the SPARC Enterprise M8000/M9000 servers components and lists their physical specifications.

1.2.1 System Components

1.2.1.1 Names and Corresponding Capacities and Functions

TABLE 1-2 lists the names and the capacities and functions of the SPARC Enterprise M8000/M9000 servers components.

TABLE 1-2 Names and Quantities (1 of 2)

Name	Capacity/function	Remarks
SPARC Enterprise M8000 server	Accommodates up to four CMUs [up to 16 CPU modules: (32 cores for SPARC64 VI processors, 64 cores for SPARC64 VII processors)] and up to four IOUs.	
SPARC Enterprise M9000 server (base cabinet)	Accommodates up to eight CMUs [up to 32 CPU modules: (64 cores for SPARC64 VI processors, 128 cores for SPARC64 VII processors)] and up to eight IOUs.	The SPARC Enterprise M9000 server, when combined with an expansion cabinet can accommodate up to 16 CMUs [up to 64 CPU modules: (128 cores for the SPARC64 VI processor, 256 cores for the SPARC64 VII processor)] and up to 16 IOUs.
SPARC Enterprise M9000 server (expansion cabinet)	Accommodates up to eight CMUs [up to 32 CPU modules: (64 cores for SPARC64 VI processors, 128 cores for SPARC64 VII processors)] and up to eight IOUs.	
Rack-mountable Dual Power Feed	Provides power redundancy (with single-phase dual power feed) for a SPARC Enterprise M8000 server.	Optional.

TABLE 1-2 Names and Quantities (2 of 2)

Name	Capacity/function	Remarks
Power Cabinet	<p>There are two types of Power Cabinet:</p> <ul style="list-style-type: none"> • Device that provides three-phase dual power feed for a SPARC Enterprise M8000 server • Device that provides single-phase dual power feed or three-phase dual power feed for a SPARC Enterprise M9000 server 	<p>One power cabinet is required for each SPARC Enterprise M8000 server.</p> <p>One power cabinet is required for each SPARC Enterprise M9000 server of the base or expansion cabinet type. (The device that provides single-phase dual power feed is an optional product for the SPARC Enterprise M9000 server.)</p>

1.2.1.2 External Dimensions and Weights

[TABLE 1-3](#) lists the external dimensions and weights of the SPARC Enterprise M8000/M9000 servers cabinet.

TABLE 1-3 Installation Specifications (External Dimensions and Weights) (1 of 2)

Name	External dimensions [mm (inch)]				Weight [kg]	
	Width	Depth	Height	Weight [kg]		
SPARC Enterprise M8000 server	750 (29.5)	1260 (49.6)	1800 (70.9)	700		1
M8000 + Power Cabinet	1054 (41.5)	1260 (49.6)	1800 (70.9)	1020		1
SPARC Enterprise M9000 server (base cabinet)	850 (33.5)	1260 (49.6)	1800 (70.9)	940		
M9000 (base cabinet) + Power Cabinet	1154 (45.4)	1260 (49.6)	1800 (70.9)	1290		
M9000 (base cabinet + expansion cabinet)	1674 (65.9)	1260 (49.6)	1800 (70.9)	1880		2

TABLE 1-3 Installation Specifications (External Dimensions and Weights) (2 of 2)

External dimensions [mm (inch)]				
Name	Width	Depth	Height	Weight [kg]
M9000 (base cabinet + expansion cabinet) + Power Cabinet	2282 (89.8)	1260 (49.6)	1800 (70.9)	2580
Rack-mountable Dual Power Feed	489 (19.3)	1003 (39.5)	278 (10.9) [6U]	75
Power Cabinet	317 (12.5)	1244 (49.0)	1800 (70.9)	350

1 The weight of a server does not include the weight of optional hardware.

2 When combining a base cabinet and an expansion cabinet, the width of each cabinet is 837 mm (including the exterior side panels).

3 The Rack-mountable Dual Power Feed can only be mounted on the equipment rack.

4 The width of a Power Cabinet includes the exterior side panel.

1.2.1.3 System Appearance

FIGURE 1-1 to **FIGURE 1-6** show the appearance of the server components and the associated servers in their maximum configuration.

SPARC Enterprise M8000 Server Appearance

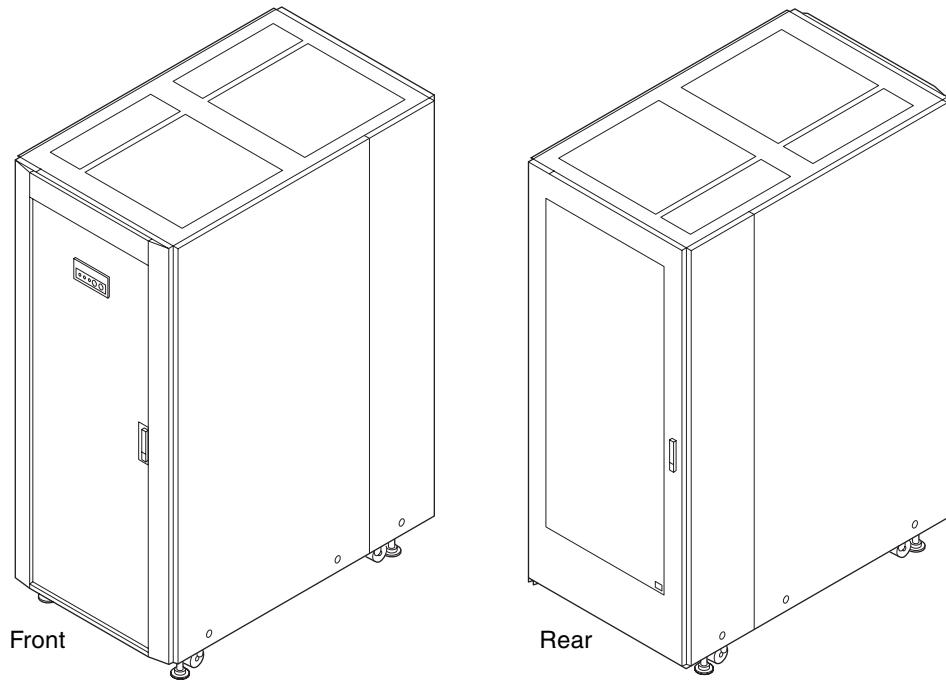


FIGURE 1-1 SPARC Enterprise M8000 Server

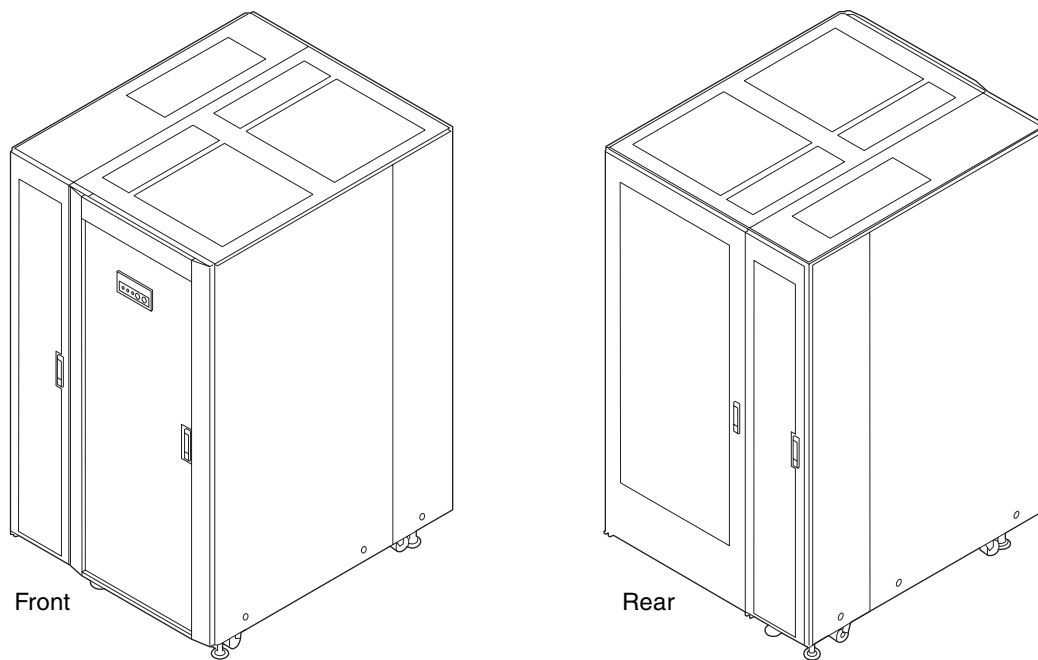


FIGURE 1-2 SPARC Enterprise M8000 Server + Power Cabinet

SPARC Enterprise M9000 Server Appearance

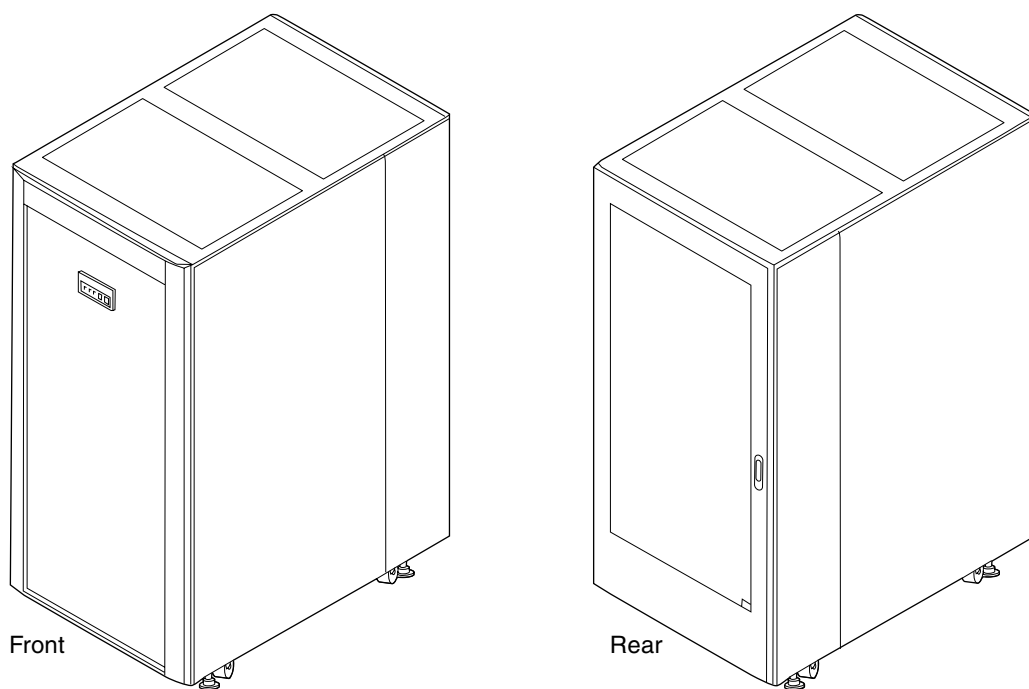


FIGURE 1-3 SPARC Enterprise M9000 Server (Base Cabinet)

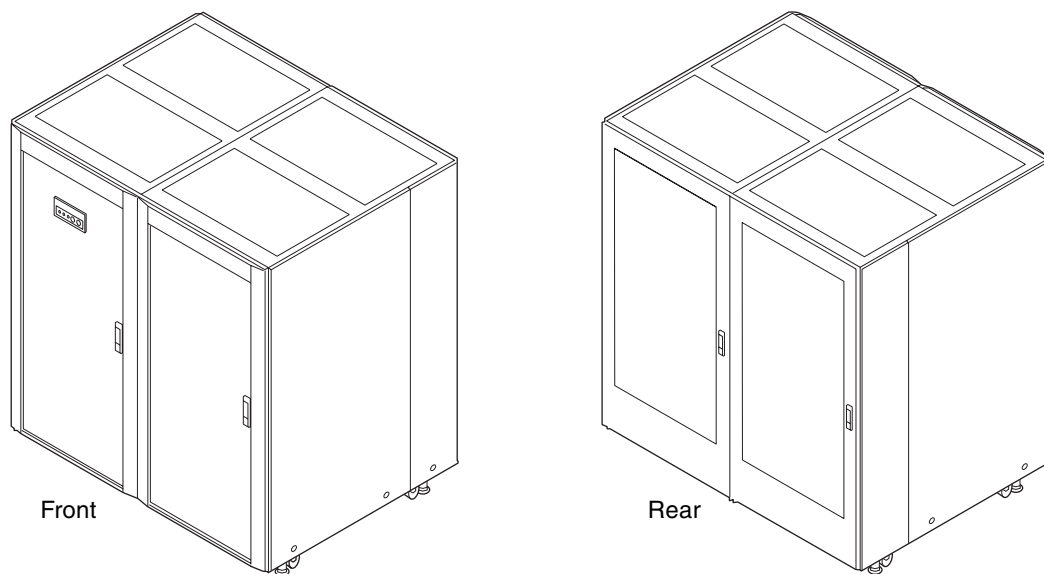


FIGURE 1-4 SPARC Enterprise M9000 Server (Base Cabinet + Expansion Cabinet)

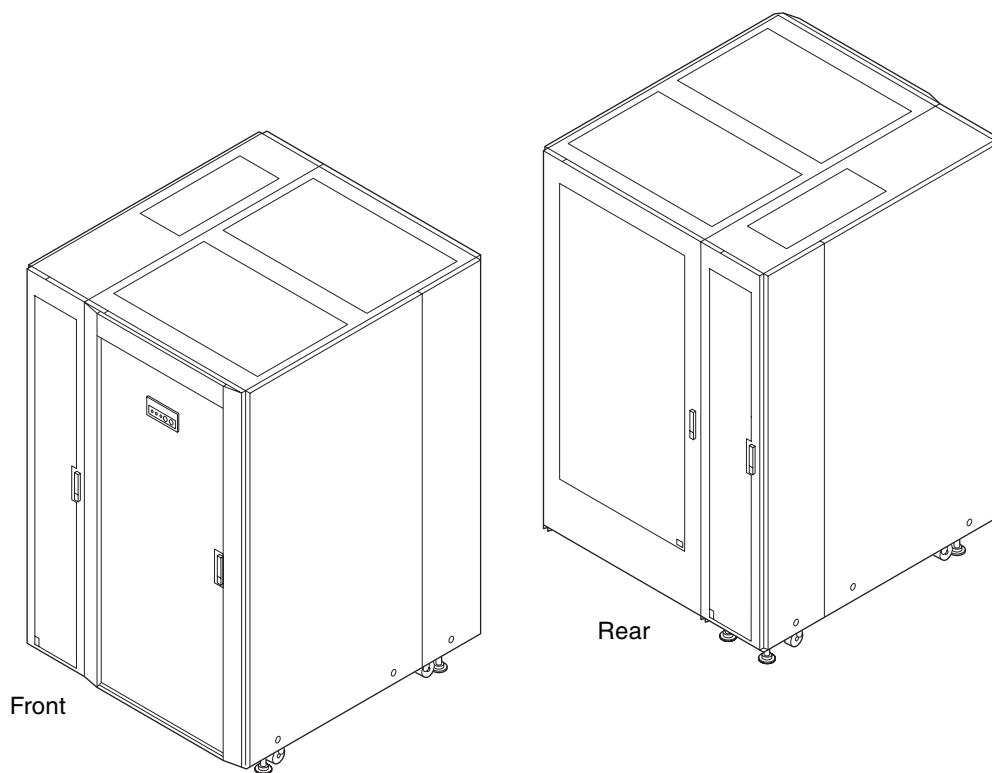


FIGURE 1-5 SPARC Enterprise M9000 Server (Base Cabinet + Power Cabinet)

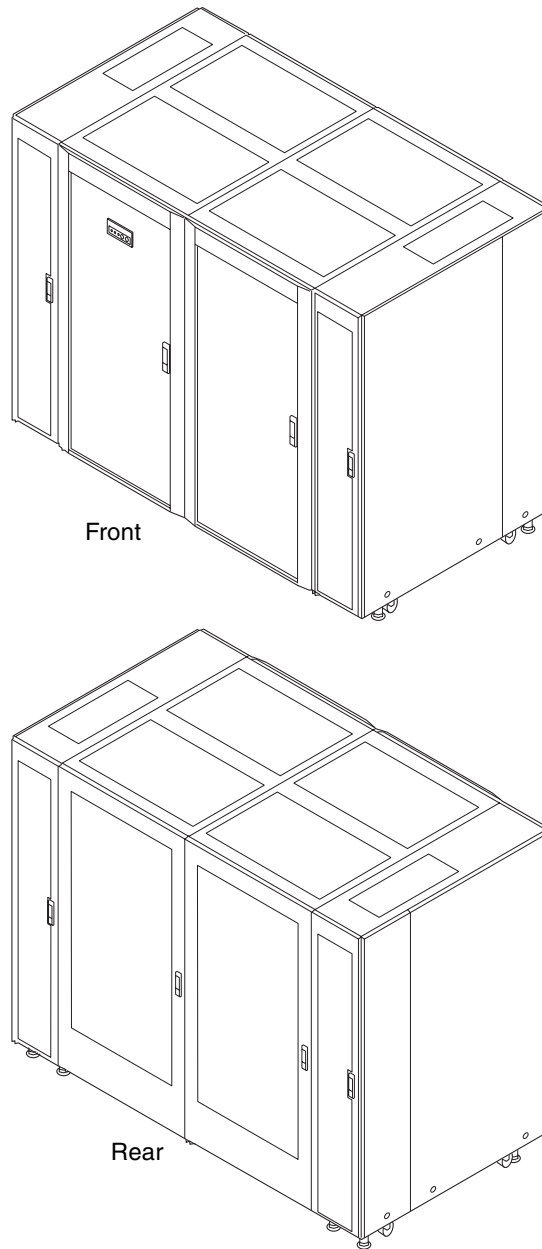


FIGURE 1-6 SPARC Enterprise M9000 Server (Base Cabinet + Expansion Cabinet + Power Cabinet)

1.2.2 System Installation (Space)

1.2.2.1 Size and Space Specifications

Before starting to assemble a SPARC Enterprise M8000/M9000 server installation, secure a service area (maintenance area) that is large enough for each device (cabinet) plus required service access space for each component. [FIGURE 1-7](#) to [FIGURE 1-16](#) show the space required for installation of each server.

SPARC Enterprise M8000 Server Installation Area

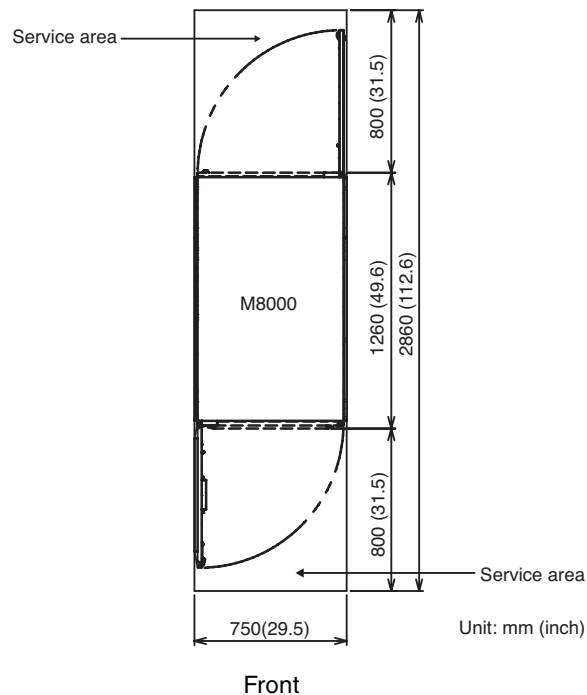


FIGURE 1-7 SPARC Enterprise M8000 Server Installation Area

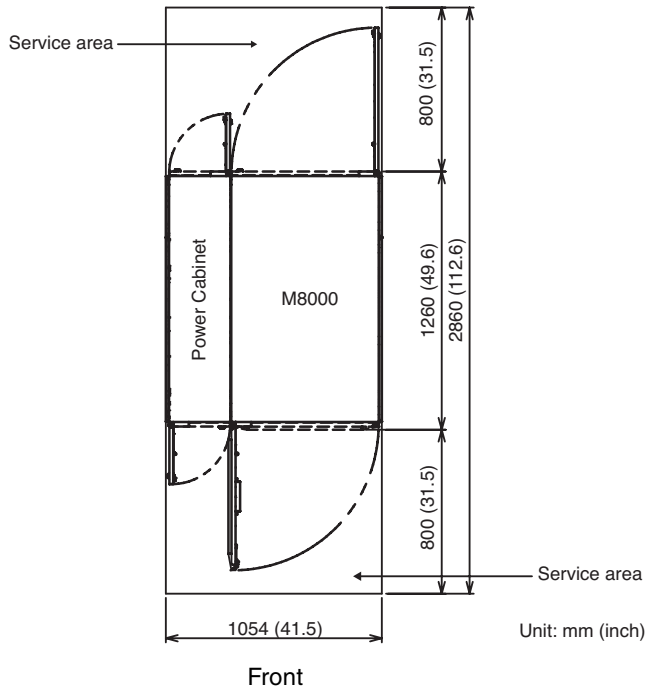


FIGURE 1-8 SPARC Enterprise M8000 Server + Power Cabinet Installation Area

Note – Before mounting units in a SPARC Enterprise M8000 server equipment rack, secure the service areas shown.

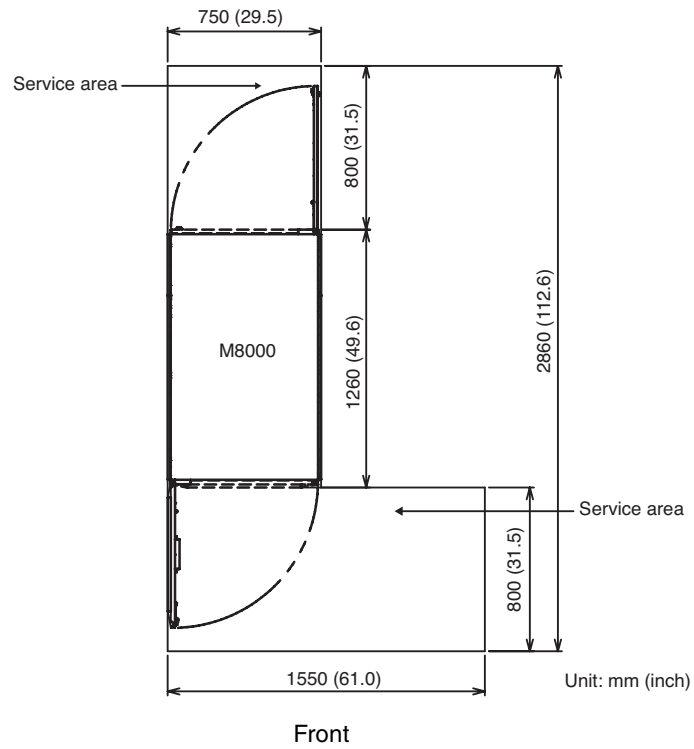


FIGURE 1-9 SPARC Enterprise M8000 Server (With an Equipment Rack) Installation Area

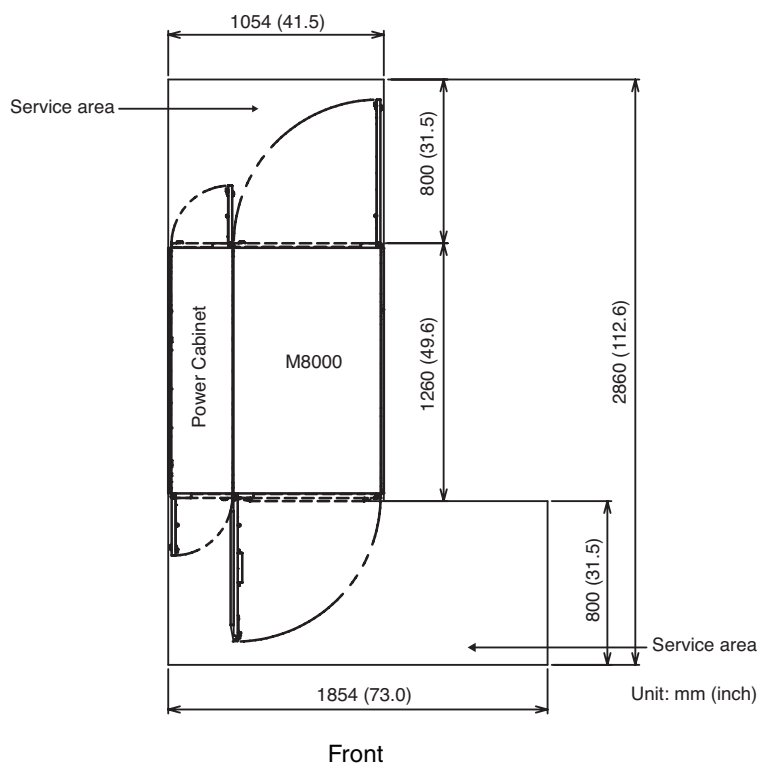


FIGURE 1-10 SPARC Enterprise M8000 Server (With an Equipment Rack) + Power Cabinet Installation Area

Note – Before mounting units in an SPARC Enterprise M8000 server equipment rack at a location where no space can be secured on the right side of the server equipment, secure the service areas shown.

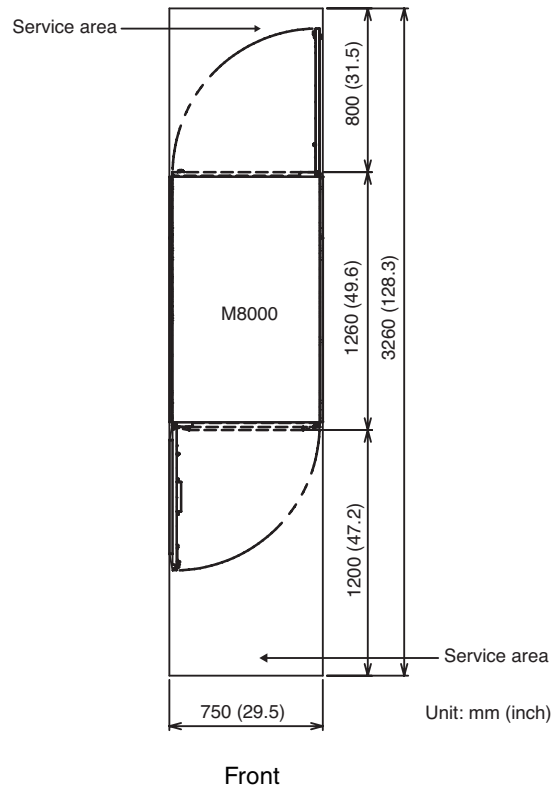


FIGURE 1-11 SPARC Enterprise M8000 Server (With an Equipment Rack) Installation Area

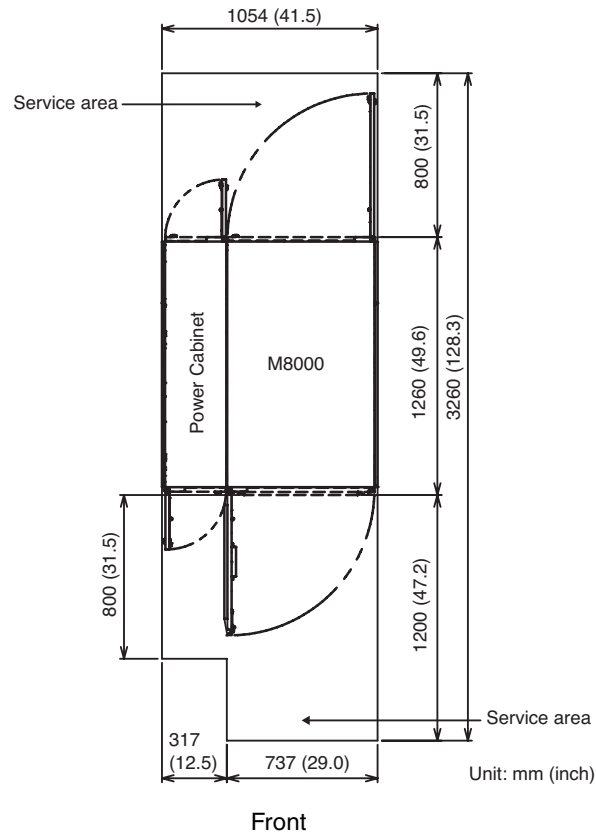


FIGURE 1-12 SPARC Enterprise M8000 Server (With an Equipment Rack) + Power Cabinet Installation Area

SPARC Enterprise M9000 Server Installation Area

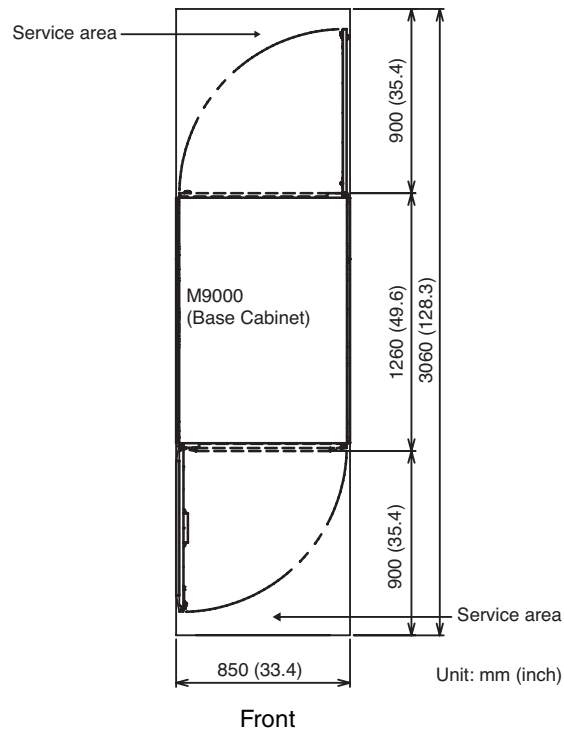


FIGURE 1-13 SPARC Enterprise M9000 Server (Base Cabinet) Installation Area

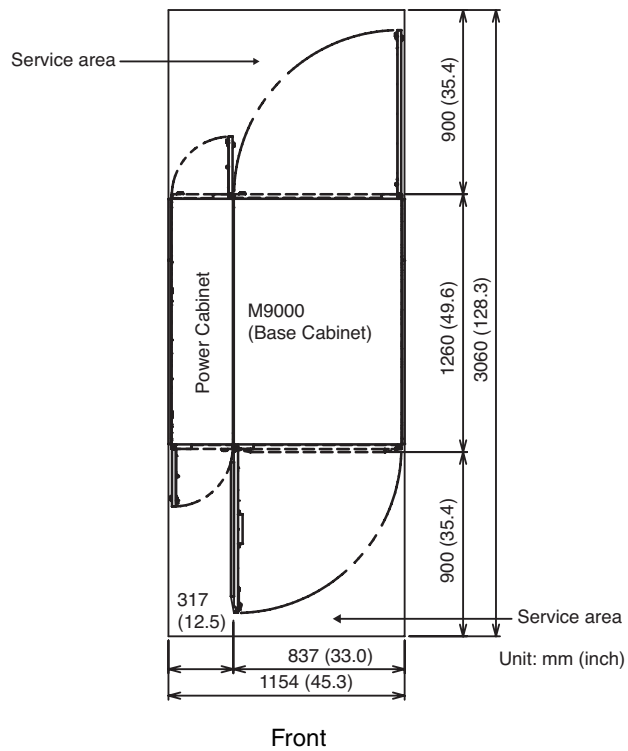


FIGURE 1-14 SPARC Enterprise M9000 Server (Base Cabinet) + Power Cabinet Installation Area

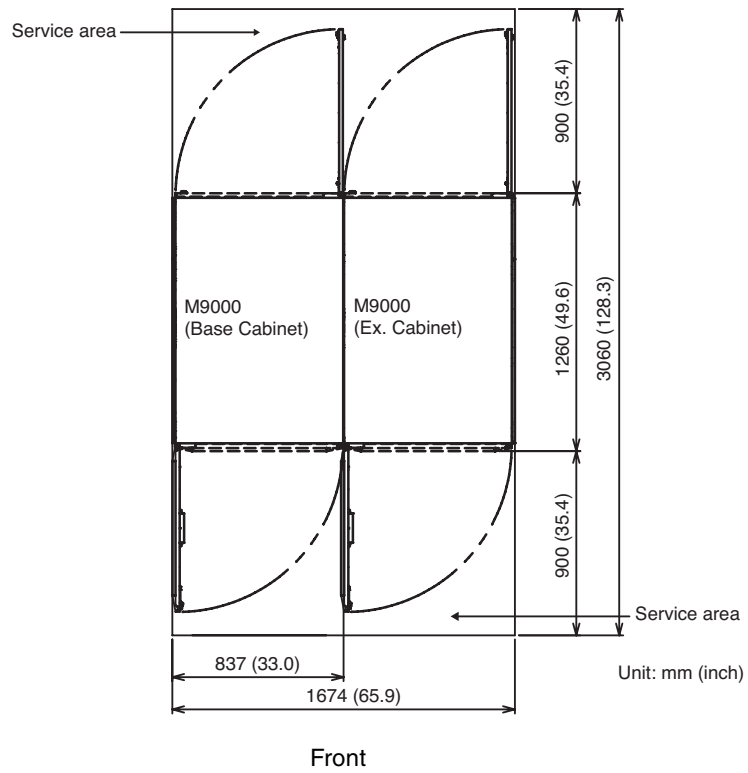


FIGURE 1-15 SPARC Enterprise M9000 Server (Base Cabinet + Expansion Cabinet) Installation Area

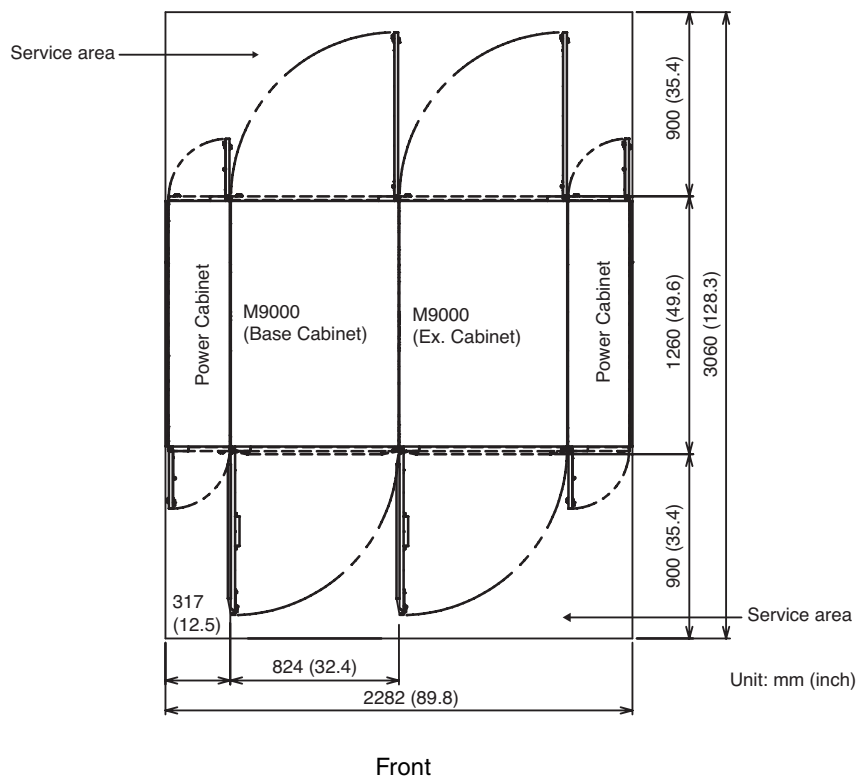


FIGURE 1-16 SPARC Enterprise M9000 Server (Base Cabinet + Expansion Cabinet) + Power Cabinet Installation Area

1.2.2.2 Footprints of the Components

FIGURE 1-17 to FIGURE 1-22 show the bottom of the SPARC Enterprise M8000/M9000 servers components, such as the openings for laying cables, air inlet ports used for cooling, legs, and casters. The views in these figures are transparent (see-through) views of the bottom surface of the server as seen from directly above the top of the server.

The values indicated are layout values of the rack. If its feet are fixed to the floor, size difference ($\pm 2\text{mm}$) must be take into consideration to designate its location.

SPARC Enterprise M8000 Server Footprint

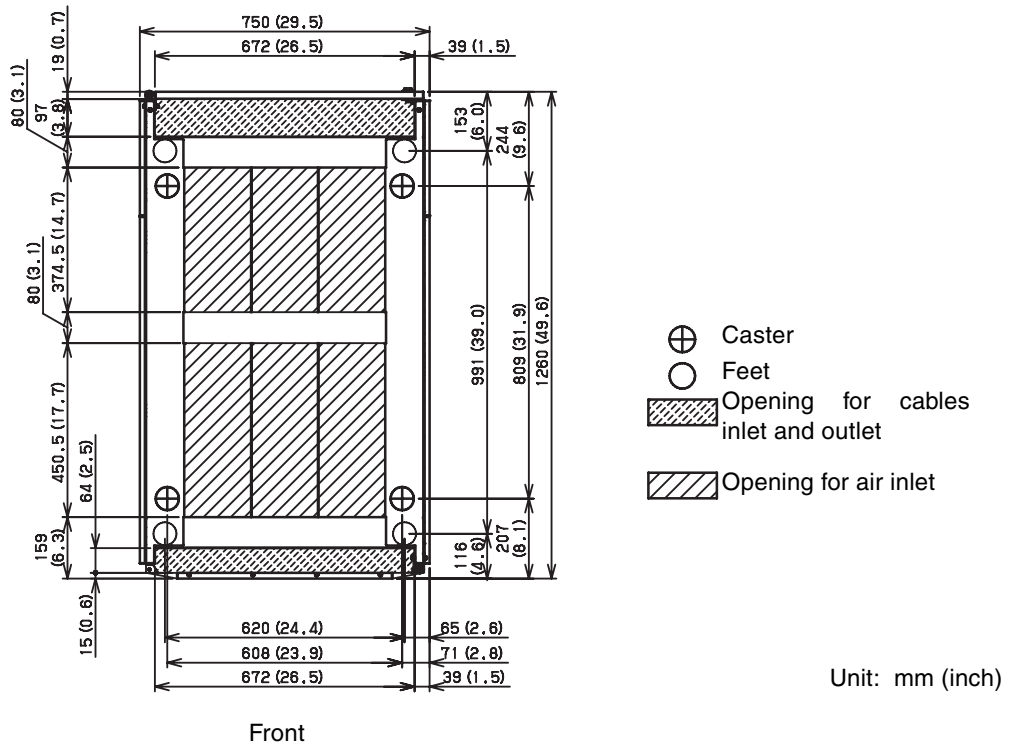


FIGURE 1-17 SPARC Enterprise M8000 Server Footprint

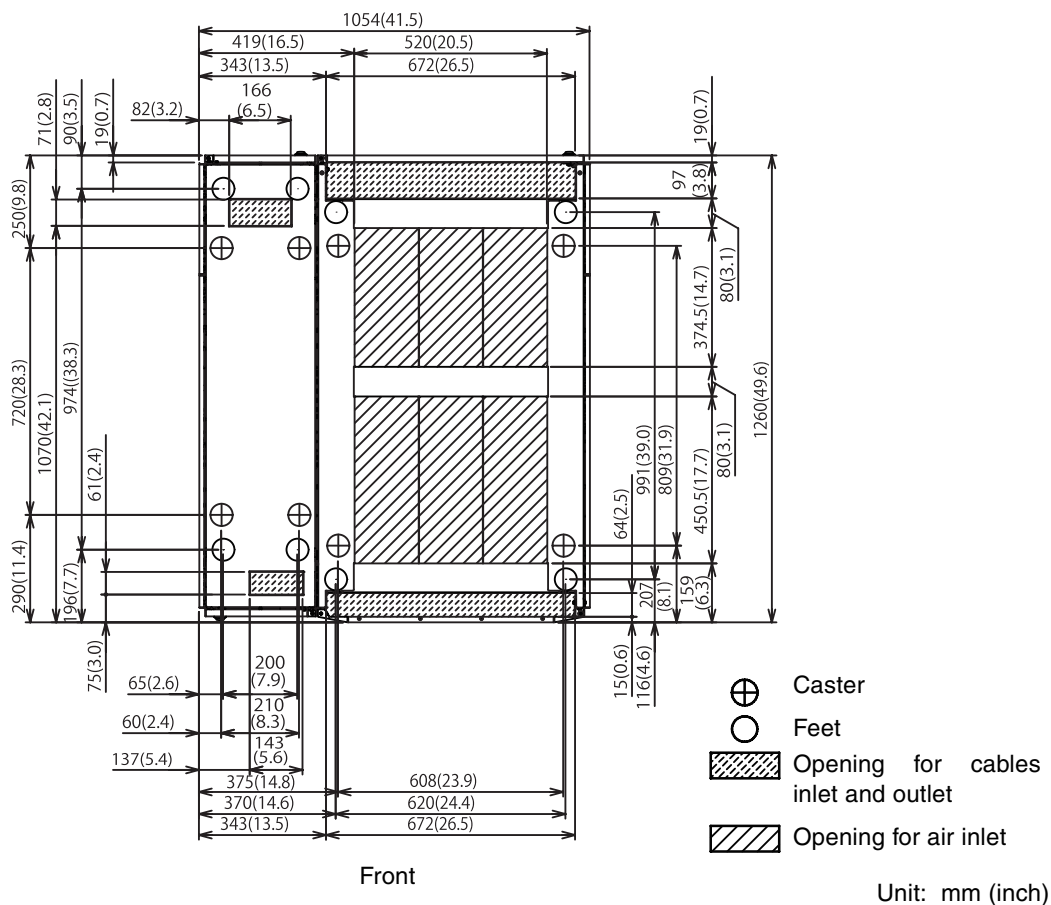


FIGURE 1-18 SPARC Enterprise M8000 Server + Power Cabinet Footprint

Technical drawing of a rectangular structure, likely a component of a machine or a building part, showing dimensions in millimeters (mm) and inches (in). The drawing includes a central rectangular area with diagonal hatching, surrounded by a border. The dimensions are as follows:

- Overall Width:** 850 (33.5) mm
- Overall Height:** 1260 (49.6) mm
- Top Section Dimensions:**
 - Top edge: 620 (24.4) mm
 - Top edge: 772 (30.4) mm
 - Top edge: 115 (4.5) mm
 - Top edge: 39 (1.5) mm
- Bottom Section Dimensions:**
 - Bottom edge: 708 (27.9) mm
 - Bottom edge: 718 (28.3) mm
 - Bottom edge: 772 (30.4) mm
 - Bottom edge: 71 (2.8) mm
 - Bottom edge: 66 (2.6) mm
 - Bottom edge: 39 (1.5) mm
- Left Section Dimensions:**
 - Left edge: 15 (0.6) mm
 - Left edge: 222 (8.7) mm
 - Left edge: 80 (3.1) mm
 - Left edge: 370 (14.6) mm
 - Left edge: 125 (4.9) mm
 - Left edge: 370 (14.6) mm
 - Left edge: 82 (3.2) mm
 - Left edge: 117 (4.6) mm
- Right Section Dimensions:**
 - Right edge: 171 (6.7) mm
 - Right edge: 267 (10.5) mm
 - Right edge: 914 (36.0) mm
 - Right edge: 723 (28.5) mm
 - Right edge: 175 (6.9) mm
 - Right edge: 270 (10.6) mm

Front

Chapter 1 Physical Specification 1-25

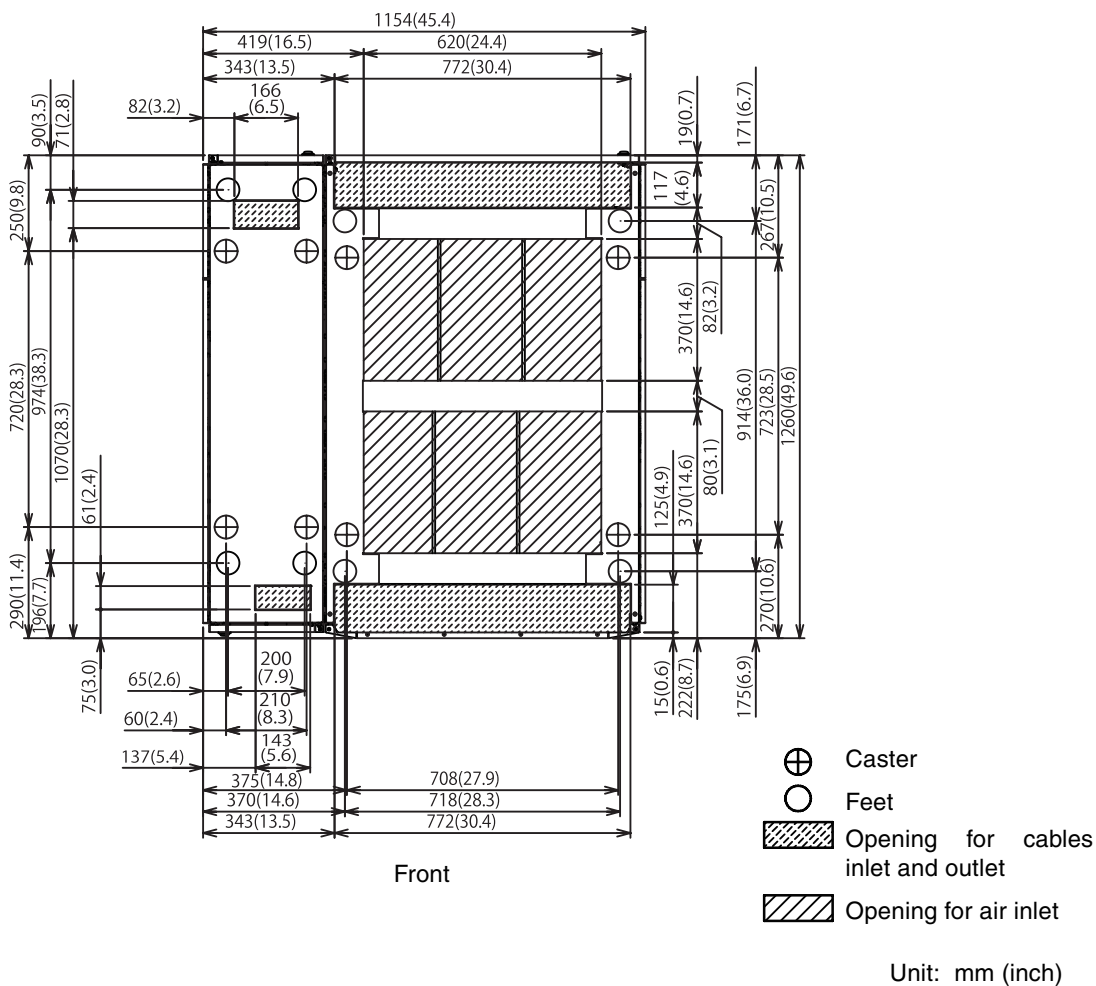


FIGURE 1-20 SPARC Enterprise M9000 Server (Base Cabinet) + Power Cabinet Footprint

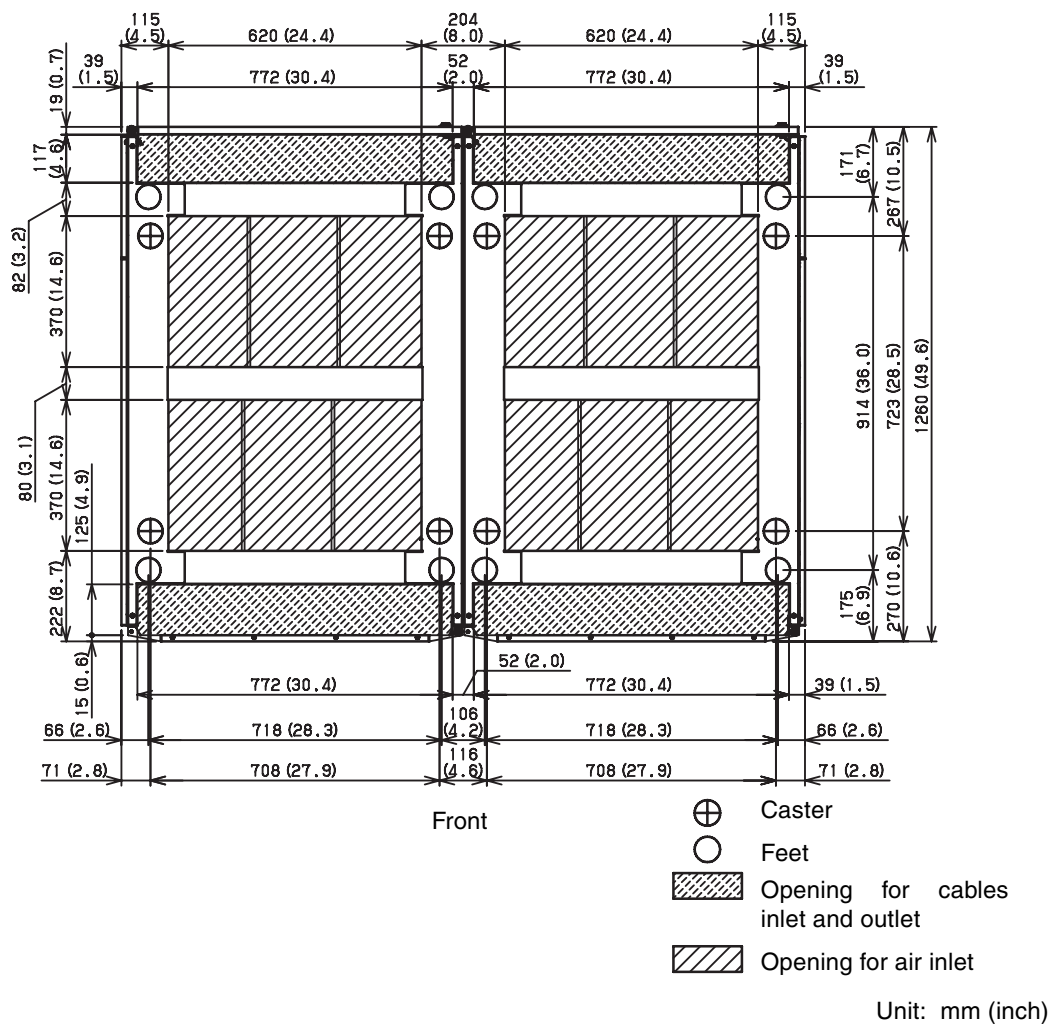


FIGURE 1-21 SPARC Enterprise M9000 Server (Base Cabinet + Expansion Cabinet) Footprint

1.2.2.3 Free-Access Floor Openings for Underfloor Air-Conditioning

Use underfloor air conditioning to cool the SPARC Enterprise M9000 server (with an extended cabinet).

To use underfloor air conditioning, air-conditioning openings must be provided on the free-access floor under the cabinet. [FIGURE 1-23](#) and [FIGURE 1-24](#) show examples of floor openings. There must be four openings of sizes corresponding to the recommended value for underfloor air-conditioning. However, if these openings cannot be prepared, use the largest possible floor openings that can be prepared in the raised floor under the cabinet or in the area around the cabinet, after taking into consideration such factors as the air-conditioning capacity required for the cabinet, the floor strength, and the locations of the leveling feet.

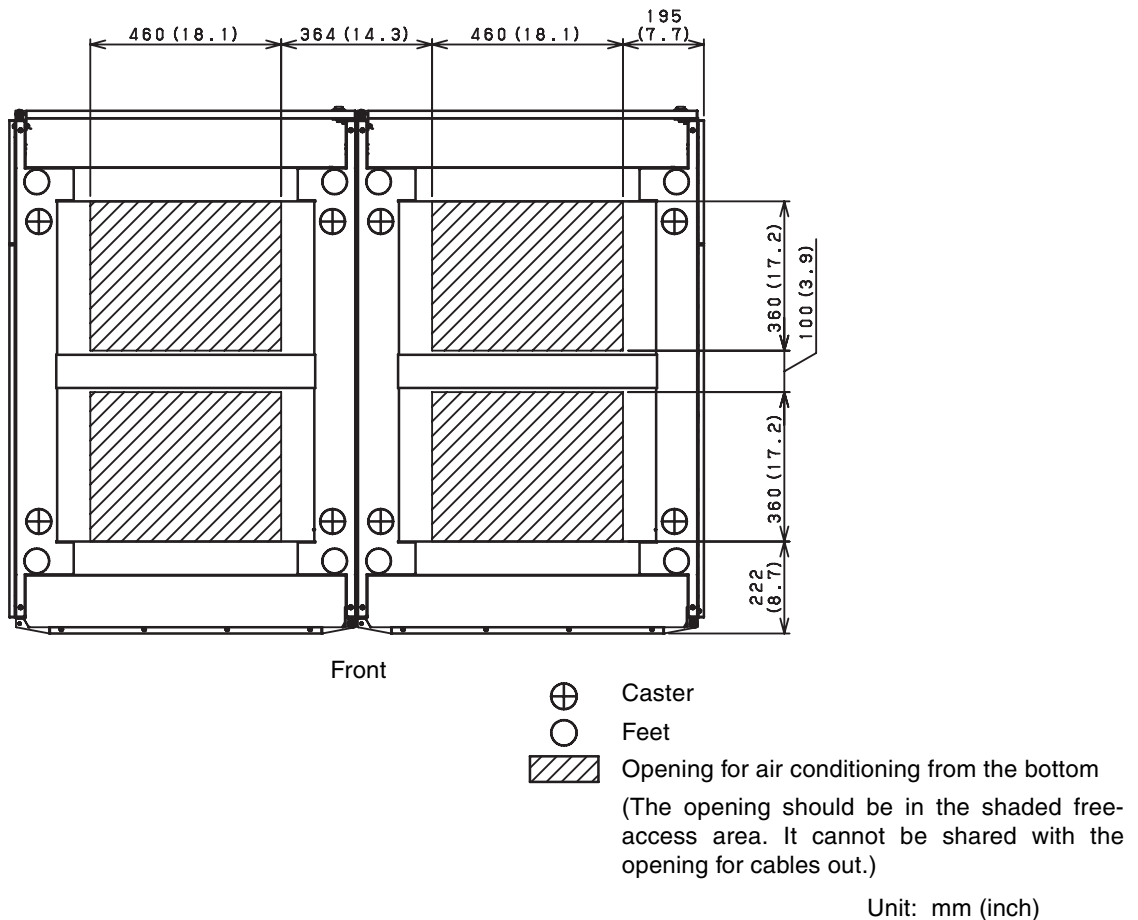


FIGURE 1-23 SPARC Enterprise M9000 Server (Base Cabinet + Expansion Cabinet) Floor Openings

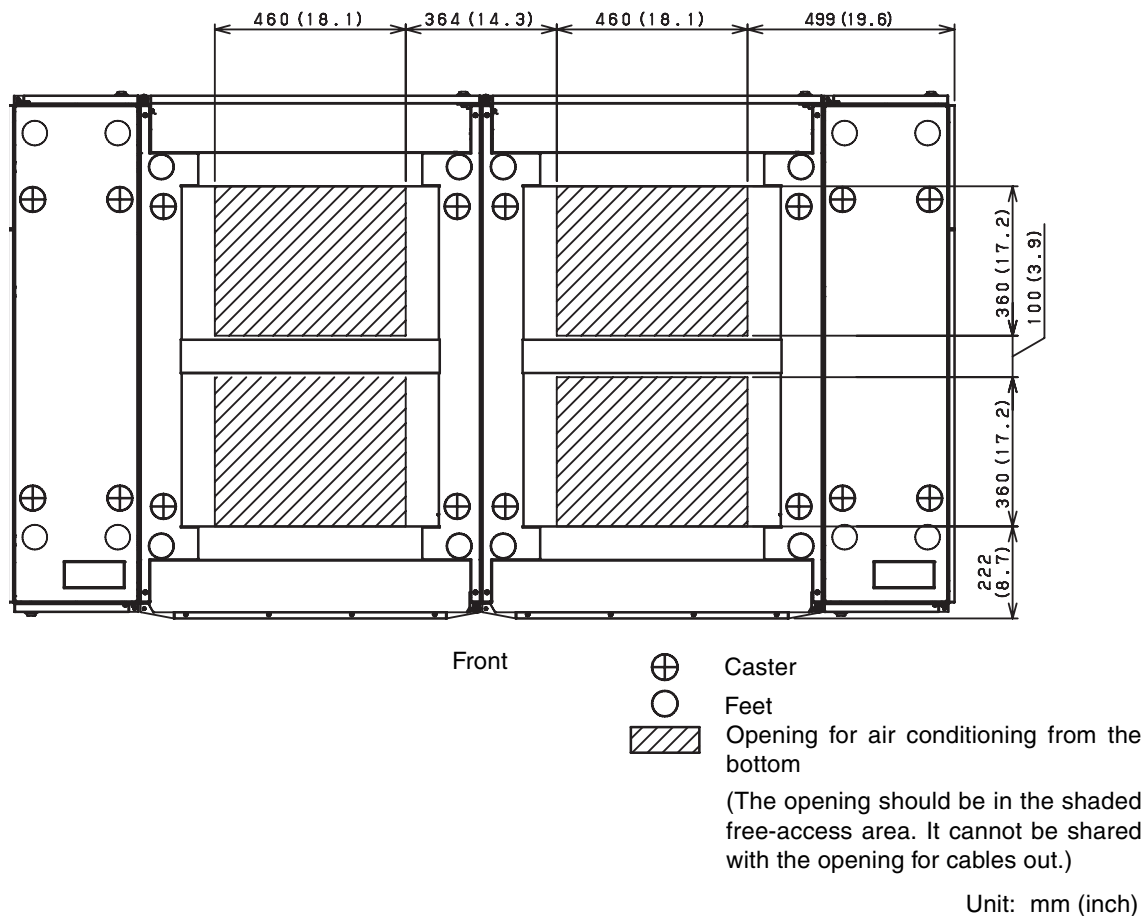


FIGURE 1-24 SPARC Enterprise M9000 Server (Base Cabinet + Expansion Cabinet) + Power Cabinet Footprint

1.2.2.4 Ceiling Height

The minimum ceiling height for the SPARC Enterprise M8000/M9000 server is 2.3m (7.5 feet), measured from the true floor or a raised floor, whichever is higher. The space above the server and its surroundings must not restrict the movement of cooling air between the air conditioner and the server.

The space above the server and its surroundings must not restrict the following:

- The movement of cooling air between the air conditioner and the bottom of the server
- The movement of the hot air coming out of the top of the server

1.2.3 Planning Your Access Route

This section describes necessary considerations before you move the server to its installation destination.

1.2.3.1 Space Required for System Transport

The access route must satisfy the requirements listed in [TABLE 1-4](#).

Each cabinet is packed with simple packaging or in a wood-framed case for shipping of the server. If it is difficult to carry the packed cabinet to the installation destination, remove the packing materials, front and rear doors, side panels, and/or other parts as necessary.

If the cabinet weight exceeds the minimum withstand load for the transport equipment used, you can move the cabinet with its PSU and FAN unit (about 4 kg each) removed.

TABLE 1-4 Space Required for Transport (1 of 2)

Name	Device status during transport ¹	Minimum door height [mm (inch)]	Minimum door width [mm (inch)]	Minimum passage width [mm (inch)]	Minimum elevator car depth [mm (inch)]	Minimum withstand load of transport equipment [kg] ³	Maximum inclination of access route [°]
SPARC Enterprise M8000 server	Simple packaging ¹	1900 (74.8)	1000 (39.4)	1200 (47.2)	1500 (59.0)	820	10
	Without front and rear doors or side panels	1900 (74.8)	800 (31.5)	1000 (39.4)	1350 (53.1)	690	10
	Tri-Wall ²	2100 (82.7)	1800 (70.9)	1800 (70.9)	1100 (43.3)	830	10
	Wooden ² packing	2100 (82.7)	1900 (74.8)	1900 (74.8)	1100 (43.3)	980	10

TABLE 1-4 Space Required for Transport (2 of 2)

Name	Device status during transport ¹	Minimum door height [mm (inch)]	Minimum door width [mm (inch)]	Minimum passage width [mm (inch)]	Minimum elevator car depth [mm (inch)]	Minimum withstand load of transport equipment [kg] ³	Maximum inclination of access route [°]
SPARC Enterprise M9000 server (Base cabinet) (Expansion cabinet)	Simple packaging ¹	1900 (74.8)	1100 (43.3)	1300 (51.2)	1500 (59.0)	950	10
	Without front and rear doors or side panels	1900 (74.8)	900 (35.4)	1100 (43.3)	1350 (53.1)	820	10
	Tri-Wall ²	2100 (82.7)	1800 (70.9)	1800 (70.9)	1200 (47.2)	1050	10
	Wooden ² packing	2100 (82.7)	1800 (70.9)	1800 (70.9)	1200 (47.2)	1100	10
Power Cabinet	Simple packaging ¹	1900 (74.8)	700 (27.6)	900 (35.4)	1500 (59.0)	350	10
	Without front and rear doors or side panels	1900 (74.8)	700 (27.6)	900 (35.4)	1350 (53.1)	320	10
	Tri-Wall ²	2100 (82.7)	1600 (63.0)	1600 (63.0)	1200 (47.2)	450	10
	Wooden ² packing	2100 (82.7)	1700 (67.0)	1700 (67.0)	1200 (47.2)	500	10

1 Simple packaging means a device is covered only with a packing material such as a vinyl sheet instead of being packed in a wood-framed case or a cardboard box.

2 When in Tri-wall and wooden packing, use the pallet jack to move the equipment.

3 The transport equipment includes the elevator and pallet jack used to transport the device.

1.2.3.2 Other Considerations

Confirm that the access route is free of any steps and other obstacles that would expose the device to shock.

1.2.4 Cabinet Stabilization Measures

This section shows useful methods of securing a SPARC Enterprise M8000/M9000 server to prevent it from shifting due to vibration.

Method of Securing the Device to the Floor Surface

(Example of securing the SPARC Enterprise M9000 server in place)

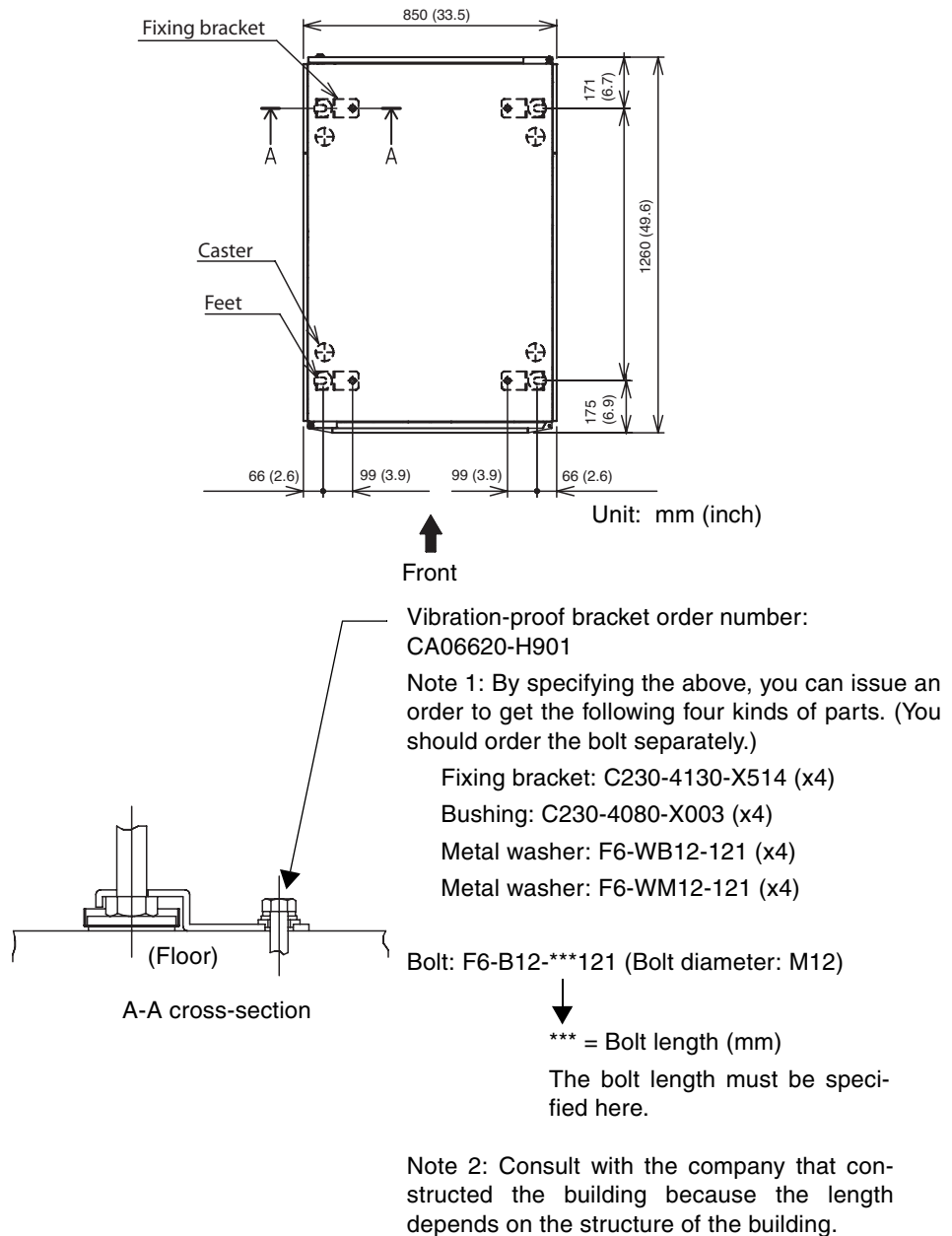


FIGURE 1-25 Cabinet Stabilization Measure: Securing the Device to the Floor Surface

Method of Securing the Device Through a Hole in the Floor

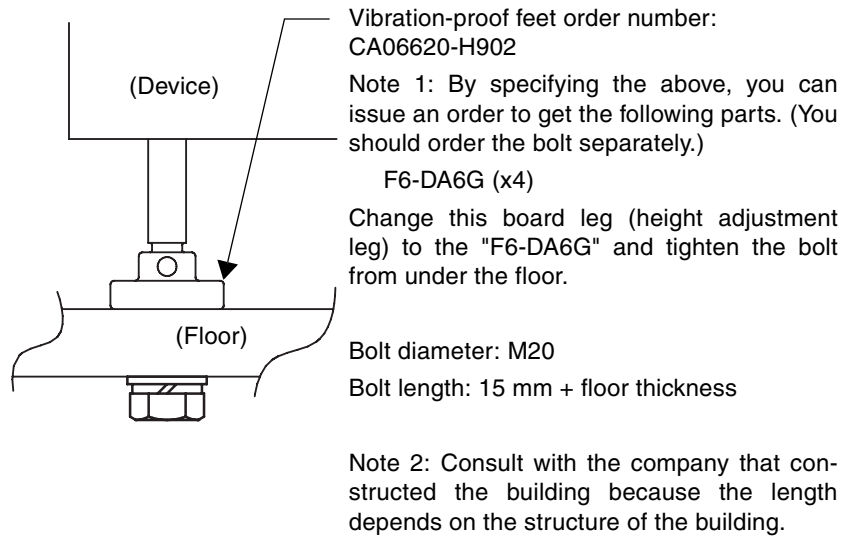


FIGURE 1-26 Cabinet Stabilization Measure: Securing the Device Through a Hole in the Floor

Network Connection Specifications

This chapter describes the network connection specifications of the SPARC Enterprise M8000/M9000 servers.

- [Section 2.1, “Planning Your Network Connection” on page 2-1](#)
- [Section 2.2, “UPS Interface” on page 2-7](#)

2.1 Planning Your Network Connection

This section provides an overview for starting the SPARC Enterprise M8000/M9000 server network required for system startup and network connections.

For details on the connections, see the *SPARC Enterprise M8000/M9000 Servers Installation Guide*.

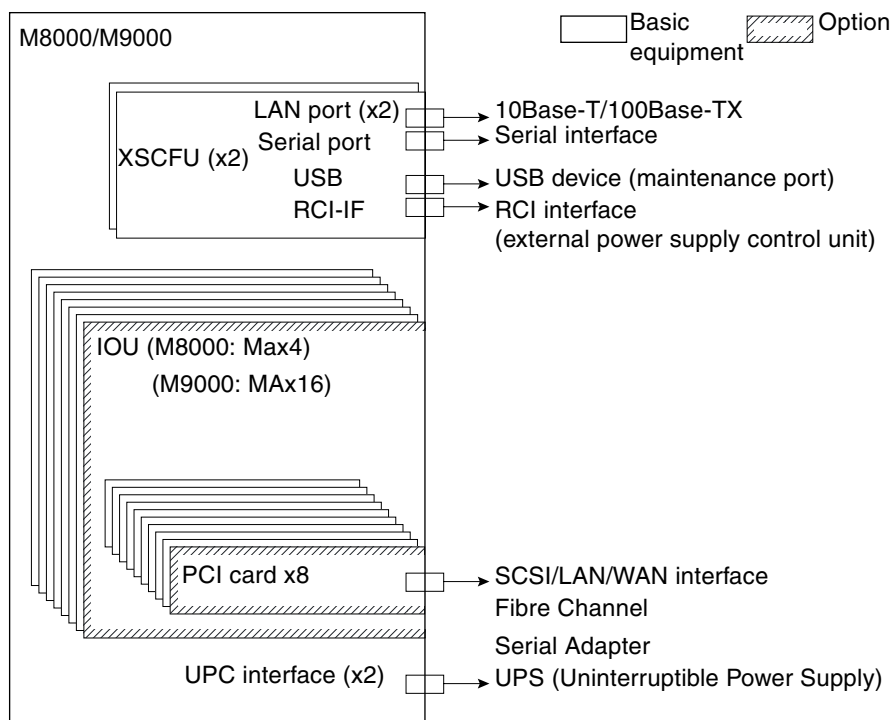


FIGURE 2-1 SPARC Enterprise M8000/M9000 Server Connection Schematic Diagram of Interface Cables

2.1.1 Setup and Network Connections

The serial port of the eXtended System Control Facility unit (XSCFU) is used for the following purposes:

- Connecting a local area network (LAN) port to the system administration network
- Monitoring the boot process
- Changing the initial values of the system controller

The administration network connects the XSCFU to the system administrator's management console. A direct connection can be used for this purpose. However, the connection is usually one through a hub or switch specific to the system control network. To initialize a LAN port, direct administration of the serial port must be performed.

2.1.2 Platform and Domain Setup Information

The following information is required for installation of the SPARC Enterprise M8000/M9000 servers:

- Host name
- IP address
- Domain
- Netmask
- IP address of the network gateway
- IP address of the network name server

In addition, the following network connections must be available:

- One serial console connection (9600 baud, N81)
- One 10/100BASE-T Ethernet connection for SCF (connected to Port 0)
- One 10/100BASE-T Ethernet connection for each domain

Note – The XSCF Ethernet port is IEEE 802.3i and IEEE 802.3u compliant. This requires auto-negotiation for the port into which it terminates.

2.1.3 Selecting a System Control Network Configuration

Consider the following when determining the system control network configuration:

- An IP address appropriate to the existing environment can be assigned to each LAN port, and the Class B private address, which is the default address, can be changed.
- Either dual power feed or single power feed must be selected for the power feed option of your server.
- Do you have a separate LAN port or network for access by a field engineer? If not, does the field engineer have access through the serial port when maintenance is necessary?

Generally, there are three server control network configurations as follows, according to installation conditions:

- [XSCF Configuration A \(Basic Configuration\)](#)
- [XSCF Configuration B \(Restricted Configuration\)](#)
- [XSCF Configuration C \(Maximum Configuration\)](#)

XSCF Configuration A (Basic Configuration)

Only one of the two LAN ports is used. The serial port and the other LAN port are reserved so that they can be used as maintenance ports. The same switch is used for system administration and the remote service. Consequently, any failure of the switch causes a failure of the server control network.

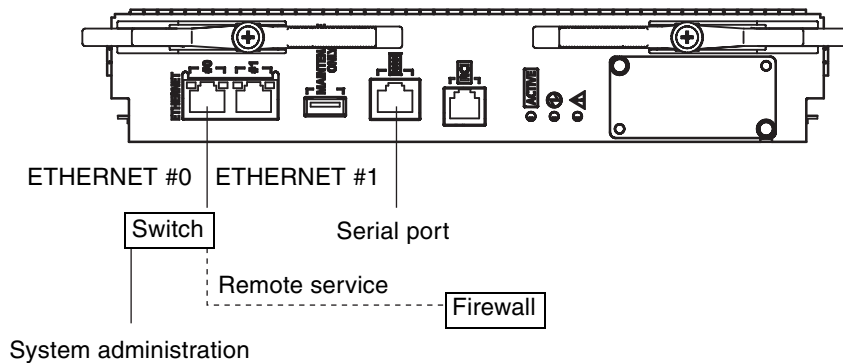


FIGURE 2-2 XSCF Configuration A (Basic Configuration)

XSCF Configuration B (Restricted Configuration)

(Restricted redundancy) - Both LAN ports are used. One port is used for system administration, and the other is used for the remote message function. If one switch fails, errors can be reported. The serial port and port for the remote service switch can be used as maintenance ports.

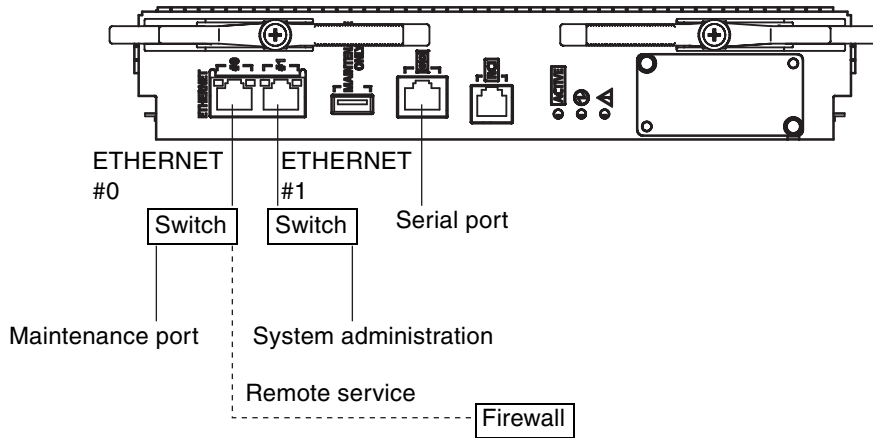


FIGURE 2-3 XSCF Configuration B (Restricted Configuration)

XSCF Configuration C (Maximum Configuration)

(Maximum redundancy) - Both LAN ports are used. Each switch has maintenance ports, which are used for the remote service or system administration. The switches are connected for failure management and system administration.

If a switch fails, no interrupt occurs in the system control network.

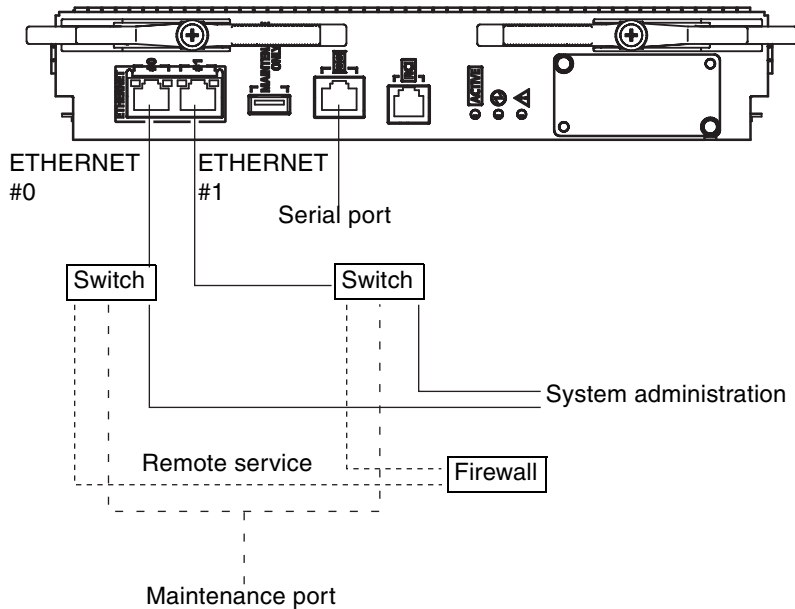


FIGURE 2-4 XSCF Configuration C (Maximum Configuration)

2.2 UPS Interface

This section describes the Uninterruptible Power Supply (UPS) interface which connects to and controls the UPS.

2.2.1 Overview

This interface is used to generate a conventional software interrupt, and to save data temporarily when a UPS is used to protect against commercial AC power supply failure.

A UPS unit is used to provide a stable supply of power to the system in the event of a power failure or an extensive power interruption.

By connecting the UPC port of the server and a UPS which has a UPC interface via signal cables, you can execute emergency shutdown processing when the commercial AC power supply failure is detected.

2.2.2 Signal Cables

Use shielded and paired cables. The cables have the following specifications:

- DC resistance (roundtrip/1 pair): 400 Ω /km or less
- Cable length: Up to 10 m (33 ft.)

2.2.3 Signal Line Configuration

This section describes signal definitions and electrical specifications.

2.2.3.1 Definitions of Signals

FIGURE 2-5 shows the signal line configuration when connected to a UPS.

TABLE 2-1 defines these signal lines.

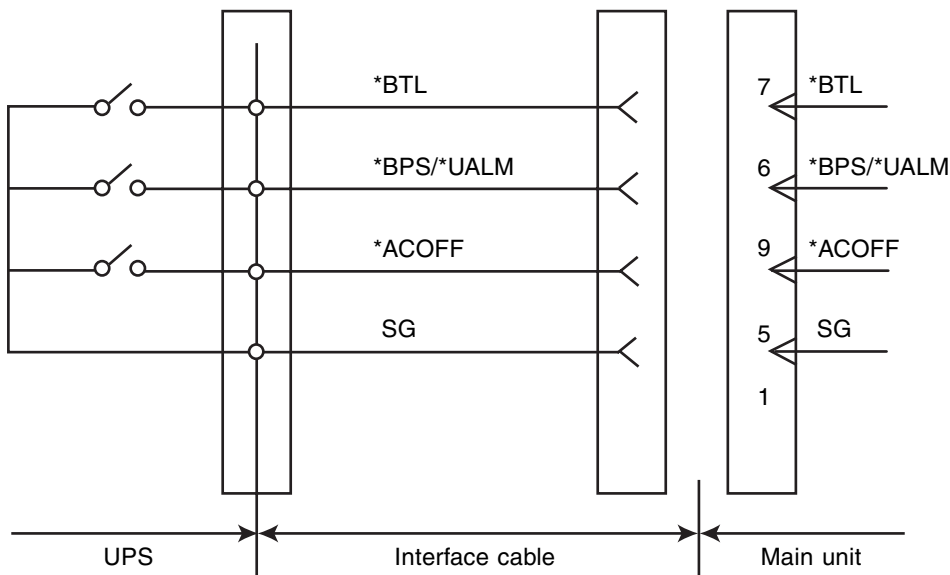


FIGURE 2-5 Connection With UPS

TABLE 2-1 UPS Interface Signals

Signal name	Definitions	Pin number	Remarks
*BPS/*UALM	Signal indicates faulty UPS conditions	6	
*BTL	Signal provides a warning of a low battery level and a pending UPS failure.	7	Enabled with ON (Note1)
*ACOFF	Signal indicates power failure at the commercial AC supply connector to the UPS	9	Power failure: ON Normal: OFF (Note2)
SG	Signal ground	5	
ER	Signal indicates the main unit is running (Equipment Ready)	1	(Note3)

ON: Indicates contacts are closed

OFF: Indicates contacts are open

Note1: Use a UPS capable of normal battery power supply operation for at least 10 to 60 seconds after this signal is turned on.

Note2: Use a UPS capable of normal battery power supply output without turning on the *ACOFF in an instantaneous commercial AC power failure lasting two seconds or less.

Note3: Do not connect to ER signal pin.

2.2.3.2 Electrical Specifications

TABLE 2-2 and TABLE 2-3 list the electrical specifications for the UPS interface.

Input circuit

TABLE 2-2 Electrical Specifications

Signal name	Input conditions
*BPS/*UALM	<ul style="list-style-type: none">No voltage relay contactContact rating DC 12 V, 10 mA or more (maximum 0.5A)Use of metallic contact, or lead relay is recommended.
*BTL	
*ACOFF	

Remarks: Signal-line chatter must be 1ms or less.

Output circuit

TABLE 2-3 Electrical Specifications

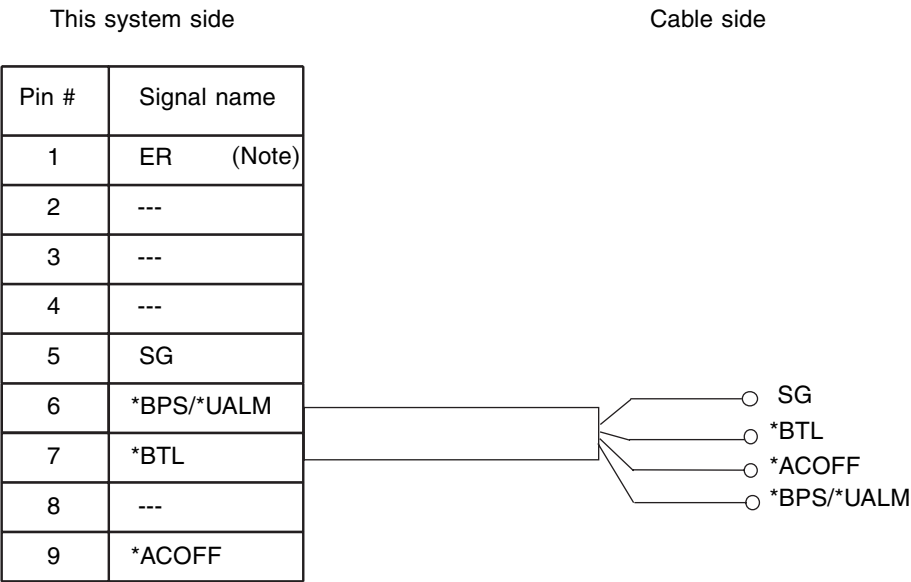
Signal name		Output conditions	
ER	Output Voltage	VOH	3.76 VDC (min)
		VOL	0 to 0.4 VDC (max)
	Output Current	VOH	-4 mA (max)
		VOL	4 mA (max)

2.2.4 Cable Connector

The interface cable has the following specifications.

- Connector type
 - D-SUB9 pin Male (install side: Female)
 - DEU-9PF-F0 (from JAE Electronics Engineering Company, or equivalent)
- Terminal array

FIGURE 2-6 identifies pin signals of the UPC connector and the UPS cable.
Do not use the unused pins (pin number 2, 3, 4 and 8 in the following diagram).
Cable side shown below.



Note: Do not use ER signal.

FIGURE 2-6 Corresponding Terminals in UPC Connector and the UPS Cable

Note – If you need UPC cables, you need to make arrangements separately. For details, contact your sales representatives.

Environmental and Electrical Specifications

This chapter explains environmental and electrical power supply specifications and conditions necessary for stable system operation:

- [Environmental Requirements](#)
- [Electrical Specifications](#)
- [Cooling Specifications](#)
- [Facility Power Requirements](#)

3.1 Environmental Requirements

3.1.1 Ambient Environmental Requirements

The SPARC Enterprise M8000/M9000 servers must satisfy the ambient environmental requirements listed in [TABLE 3-1](#).

TABLE 3-1 Specifications (Ambient Environmental Requirements)

System name	Temperature [°C (°F)] ¹		Humidity [%RH] ¹		Altitude [m (ft)]
	Operating	Non-operating	Operating	Non-operating	
SPARC Enterprise M8000 server	5 to 32 (41 to 89.6) at an installation altitude ranging from 0 to less than 1500 m (4921 feet) above sea level	0 to 50 (32 to 122)	20 to 80	8 to 80	Operating 3000 (12000)
and SPARC Enterprise M9000 server	5 to 30 (41 to 86) at an installation altitude ranging from 1500 m (4921 feet) to less than 2000 m (6562 feet) above sea level 5 to 28 (41 to 82.4) at an installation altitude ranging from 2000 m (6562 feet) to less than 2500 m (8202 feet) above sea level 5 to 26 (41 to 78.8) at an installation altitude ranging from 2500 m (8202 feet) to 3000 m (9843 feet) above sea level				Non-operating 12000 (40000)

¹ There is no condensation regardless of the temperature and humidity.

3.1.2 Recommended Ambient Temperature and Humidity

Keep the temperature in the computer room at a comfortable level for people or slightly lower. This temperature level can prevent inadequate cooling of sections of the computer room which can be due to heat generated by a device or by trapped hot air. Keeping the computer room at a comfortable level can reduce related adverse effects on each device in the entire system configuration.

Special consideration must be paid to humidity if underfloor ventilation is used. Normally, air contains water vapor. Relative humidity, which is indicated as a percentage (%) of the total amount of water vapor that can exist in the air without condensing, is inversely proportional to air temperature; it goes down when the temperature rises, and goes up when the temperature drops. For example, air with a relative humidity of 45% at a temperature of 24°C (75°F) has a relative humidity of 65% at a temperature of 18°C (64°F); and if the temperature drops farther, the relative humidity rises to more than 65%, eventually to condense out as water droplets.

Air conditioning facilities usually do not provide functions to precisely monitor and control the temperature and humidity throughout an entire computer room. Generally, computer room air conditioning controls the temperature and humidity

according to the monitoring data at individual points corresponding to multiple exhaust vents in the main unit and other units in the room. However, since air conditioning facilities for underfloor ventilation perform such control according to the monitoring data at each point close to an exhaust vent, the distribution of the temperature and humidity across the entire computer room is uneven.

TABLE 3-2 lists the recommended temperature and humidity values for computer rooms.

TABLE 3-2 Recommended Temperature and Humidity Values for Computer Rooms

Air conditioning method	Point close to underfloor exhaust vent			Monitoring and control point in room			Remarks
	Temperature		Humidity %	Temperature		Humidity %	
	°C	°F		°C	°F		
Direct blowing or duct blowing	-	-	-	24 ±2	75 ±4	45 ±5	-
Underfloor ventilation	18 ±1	64 ±2	65 ±5	Target temperature of 24°C	Target temperature of 75°F	About 45% at 24°C	The room temperature and humidity fluctuate, without control, according to the thermal load in the room.
Direct blowing or using duct blowing and underfloor ventilation together	18 ±1	64 ±2	65 ±5	24 ±2	75 ±4	45 ±5	-

3.1.3 Vibration Requirements

The allowable vibrations in the SPARC Enterprise M8000/M9000 servers are listed in [TABLE 3-3](#).

TABLE 3-3 Specifications (Allowable Vibration)

System name	Allowable vibration [gal]	
	Operating	Non-Operating
SPARC Enterprise M8000 server	250 ¹	400 ^{1, 2}
SPARC Enterprise M9000 server		

1 Allowable vibration (Sun and Fujitsu standards) for artificially generated seismic waves
2 The value for non-operation is applicable when vibration-proofing measures are taken for the leveling feet.

3.2 Electrical Specifications

SPARC Enterprise M8000/M9000 servers can use two types of power supply: single-phase power and three-phase power. Redundant power cables are supported only on servers that have the dual power feed option. The dual power feed option is included by default on servers that are configured for three-phase power.

Note – Power cables are not redundant on single power feed servers without the dual power feed option. On servers that have single power feed, all power cables must be connected and powered on at all times.

Note – With the dual power feed option, all wiring connected to the server is used to supply power, and the load is balanced at 50%/50%. Note that even if an extremely low load compromises the load balancing, it will not affect operation.

[TABLE 3-4](#) to [TABLE 3-6](#) list the power requirements for single-phase and three-phase power supplies.

3.2.1 Single-Phase Power Supplies

TABLE 3-4 Specifications (Single-Phase Power Requirements) (1 of 2)

Name	Power supply			Power consumption [kW]	Apparent power [kVA]	Power factor	Rush current [A0-p]	Leak current [mA]	Circuit breaker capacity [A]
	Voltage [V]	Phase	Frequency [Hz]						
SPARC Enterprise M8000 server	200 to 240 VAC ±10%	Single	50/60 +2%, -4%	10.5 ²	11.0 ²	0.9 or higher	100 or less ⁶	4.1 or less ⁶	30 ⁷
	100 VAC ³ ±10%			0.1 ³	-				
SPARC Enterprise M9000 server (base cabinet)	200 to 240 VAC ±10%	Single	50/60 +2%, -4%	21.3 ⁴	22.4 ⁴	0.9 or higher	100 or less ⁶	4.1 or less ⁶	30 ⁷
	100 VAC ³ ±10%			0.1 ³	-				
SPARC Enterprise M9000 server (base cabinet + expansion cabinet)	200 to 240 VAC ±10%	Single	50/60 +2%, -4%	42.6 ⁵	44.8 ⁵	0.9 or higher	100 or less ⁶	4.1 or less ⁶	30 ⁷
	100 VAC ³ ±10%			0.1 ³	-				
Power Cabinet SPARC Enterprise M9000 server (base cabinet) ¹	200 to 240 VAC ±10%	Single	50/60 +2%, -4%	21.3 ⁴	22.4 ⁴	0.9 or higher	100 or less ⁶	4.1 or less ⁶	30 ⁷

TABLE 3-4 Specifications (Single-Phase Power Requirements) (2 of 2)

Name	Power supply			Power consumption [kW]	Apparent power [kVA]	Power factor	Rush current [A0-p]	Leak current [mA]	Circuit breaker capacity [A]
	Voltage [V]	Phase	Frequency [Hz]						
Power Cabinet SPARC Enterprise M9000 server (base cabinet + expansion cabinet) ¹	200 to 240 VAC ±10%	Single	50/60 +2%, -4%	42.6 ⁵	44.8 ⁵	0.9 or higher	100 or less ⁶	4.1 or less ⁶	30 ⁷
Rack- mountable Dual Power Feed (for SPARC Enterprise M8000 server)	200 to 240 VAC ±10%			10.5 ²	11.0 ²	0.9 or higher	100 or less ⁶	4.1 or less ⁶	30 ⁷

1 This value represents when power feed is through the Power Cabinet alone.

2 This value is reached when four CMUs and four IOUs are installed.

3 The 100V power supply is used only for the FST, and this specification applies only to use in Japan.

4 This value is reached when eight CMUs and eight IOUs are installed.

5 This value is reached when 16 CMUs and 16 IOUs are installed.

6 This value represents the current for each cable.

7 This value represents the capacity of a system main line switch for each power supply of the single-phase power supplies.

3.2.2 Three-Phase Delta Power Supplies

TABLE 3-5 Specifications (Three-Phase Delta Power Requirements)

Name	Power supply		Frequency [Hz]	Power consumption [kW]	Apparent power [kVA]	Power factor	Rush current [A0-p]	Leakage current [mA]	Circuit breaker capacity [A]
	Voltage [V]	Phase							
SPARC Enterprise M8000 server + Power Cabinet	AC200- 240 ± 10%	Three- phase delta	50/60 +2%, -4%	10.5 ²	11.0 ²	0.9 or higher	100 or less ⁵	30 or less ⁵	50 ⁶
	AC100 ± 10% ¹	Single		0.1 ¹	-	-	-	-	-
SPARC Enterprise M9000 server (base cabinet) + Power Cabinet	AC200- 240 ± 10%	Three- phase delta	50/60 +2%, -4%	21.3 ³	22.4 ³	0.9 or higher	170 or less ⁵	40 or less ⁵	80 ⁶
	AC100 ± 10% ¹	Single		0.1 ¹	-	-	-	-	-
SPARC Enterprise M9000 server (base cabinet + expansion cabinet) + Power Cabinet	AC200- 240 ± 10%	Three- phase delta	50/60 +2%, -4%	42.6 ⁴	44.8 ⁴	0.9 or higher	170 or less ⁵	40 or less ⁵	80 ⁶
	AC100 ± 10% ¹	Single		0.1 ¹	-	-	-	-	-

1 The 100V power supply is used only for the FST, and this specification applies only to use in Japan.

2 This value is reached when four CMUs and four IOUs are installed.

3 This value is reached when eight CMUs and eight IOUs are installed.

4 This value is reached when 16 CMUs and 16 IOUs are installed.

5 This value represents the current for each cable.

6 This value represents the capacity of a unit main line switch for each power supply of the three-phase power supplies.

3.2.3 Three-Phase Star Power Supplies

TABLE 3-6 Specifications (Three-Phase Star Power Requirements)

Name	Power supply		Frequency [Hz]	Power consumption [kW]	Apparent power [kVA]	Power factor	Rush current [A0-p]	Leakage current [mA]	Circuit breaker capacity [A]
	Voltage [V]	Phase							
SPARC Enterprise M8000 server + Power Cabinet	AC380- 415 ± 10%	Three- phase star	50/60 +2%, -4%	10.5 ²	11.0 ²	0.9 or higher	100 or less ⁵	10 or less ⁵	30 ⁶
	AC100 ± 10% ¹	Single		0.1 ¹	-	-	-	-	-
SPARC Enterprise M9000 server (base cabinet) + Power Cabinet	AC380- 415 ± 10%	Three- phase star	50/60 +2%, -4%	21.3 ⁴	22.4 ⁴	0.9 or higher	170 or less ⁵	20 or less ⁵	50 ⁶
	AC100 ± 10% ¹	Single		0.1 ¹	-	-	-	-	-
SPARC Enterprise M9000 server (base cabinet + expansion cabinet) + Power Cabinet	AC380- 415 ± 10%	Three- phase star	50/60 +2%, -4%	42.6 ³	44.8 ³	0.9 or higher	170 or less ⁵	20 or less ⁵	50 ⁶
	AC100 ± 10% ¹	Single		0.1 ¹	-	-	-	-	-

1 The 100V power supply is used only for the FST, and this specification applies only to use in Japan.
2 This value is reached when four CMUs and four IOUs are installed.
3 This value is reached when 16 CMUs and 16 IOUs are installed.
4 This value is reached when eight CMUs and eight IOUs are installed.
5 This value represents the current for each cable.
6 This value represents the capacity of a unit main line switch for each power supply of the three-phase power supplies.

3.3 Cooling Specifications

3.3.1 Cooling (Air-Conditioning) Requirements

TABLE 3-7 lists the cooling and air-conditioning requirements for each system component.

TABLE 3-7 Specifications (Cooling and Air-Conditioning Requirements)

Name	Heat dissipation [kJ/h]	Exhaust airflow [m ³ /min.]	Cooling method	Air-conditioning type	Noise level [dBA]
SPARC Enterprise M8000 server	37800 ¹	94	Overfloor/underfloor	Forced air cooling	67
SPARC Enterprise M9000 server (base cabinet)	76680 ²	102	Overfloor/underfloor	Forced air cooling	68
SPARC Enterprise M9000 server (base cabinet + expansion cabinet)	153360 ³	205	Underfloor	Forced air cooling	68
Rack-mountable Dual Power Feed	- ⁴	- ⁴	Overfloor/underfloor	Forced air cooling	- ⁴
Power Cabinet (SPARC Enterprise M8000 server)	- ⁴	- ⁴	Overfloor/underfloor	Forced air cooling	- ⁴
Power Cabinet (for SPARC Enterprise M9000 server base cabinet)	- ⁴	- ⁴	Overfloor/underfloor	Forced air cooling	- ⁴
Power Cabinet (for SPARC Enterprise M9000 server base cabinet + expansion cabinet)	- ⁴	- ⁴	Underfloor	Forced air cooling	- ⁴

1 This value represents the heat dissipation after 4CMU/4IOU installation.

2 This value represents the heat dissipation after 8CMU/8IOU installation.

3 This value represents the heat dissipation after 16CMU/16IOU installation.

4 The heat dissipation, exhaust airflow and acoustic noise value of the Power Cabinet is included in the value for the SPARC Enterprise M8000 server or SPARC Enterprise M9000 server.

3.3.2 Airflow and Heat Dissipation

Since the SPARC Enterprise M8000/M9000 server is designed to be cooled by forced air convection, sufficient airflow throughout the entire system must be generated. To satisfy the requirements listed below, the installation space requirements listed in [Section 1.2.2, “System Installation \(Space\)” on page 1-13](#) must be observed.

Any other equipment installed around the system must not block any of the service areas, or intake and exhaust air vents.

- The SPARC Enterprise M8000 server uses internal fans to generate a total airflow of 94 cubic meters per minute (3320 cubic feet per minute [cfm]) under normal operating conditions.

- The SPARC Enterprise M9000 server uses internal fans in the base cabinet and expansion cabinet, and it generates a total airflow of 102 cubic meters per minute (3600 cubic feet per minute [cfm]) under normal operating conditions.
- The Power Cabinet and Rack-mountable Dual Power Feed of the SPARC Enterprise M8000 server uses built-in fans to generate air flow of 7 cubic meters per minute (247 cubic feet per minute [cfm]) under standard operating conditions.
- The Power Cabinet of the SPARC Enterprise M9000 server uses a built-in fan to produce air flow of 12 cubic meters per minute (424 cubic feet per minute [cfm]) under the standard operating conditions.
- The SPARC Enterprise M8000 server and Rack-mountable Dual Power Feed system draws air from the bottom of the cabinet and exhausts it at the top and rear.

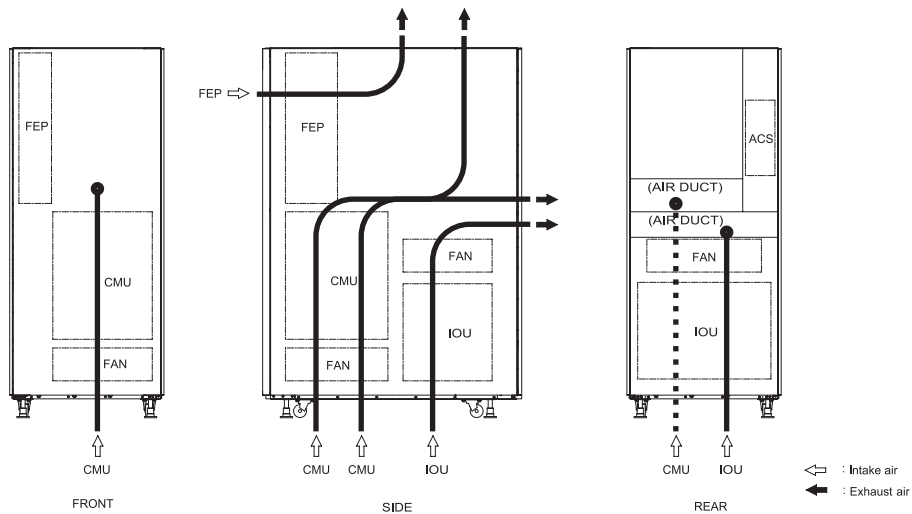


FIGURE 3-1 Cooling Air and Exhaust Flows of SPARC Enterprise M8000 Server and Rack-mountable Dual Power Feed

- The SPARC Enterprise M9000 server draws air from the bottom of the cabinet and exhausts it at the top.

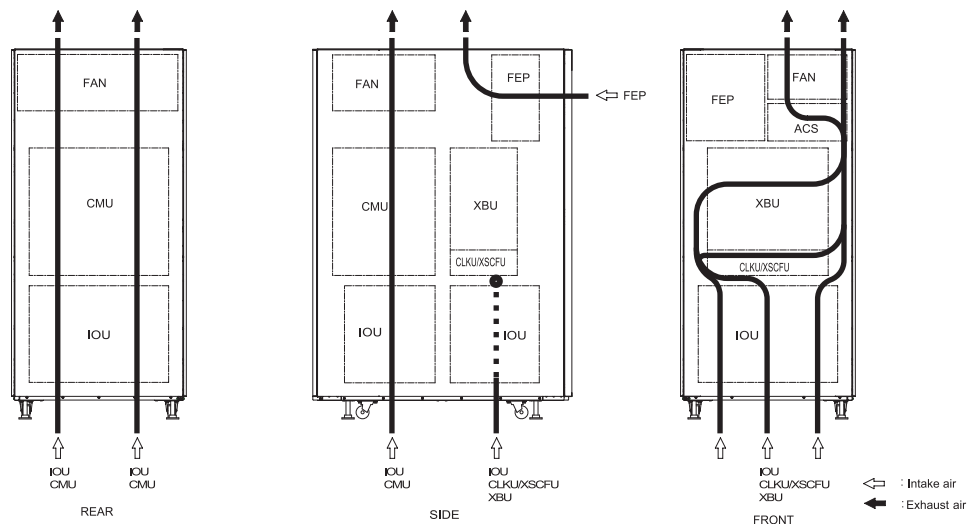


FIGURE 3-2 Cooling Air and Exhaust Flows of SPARC Enterprise M9000 Server

- The Power Cabinet draws air from the front of the cabinet and exhausts it at the rear.

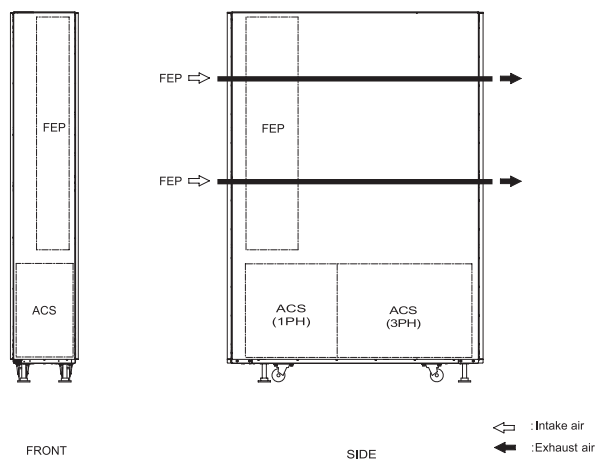


FIGURE 3-3 Cooling Air and Exhaust Flows of Power Cabinet

3.4 Facility Power Requirements

This section describes the power supply requirements for system operation. Obtain the appropriate power supply after confirming the power requirements for the system to be installed.

3.4.1 Power Supply to Devices

3.4.1.1 Single-Phase Power Supply

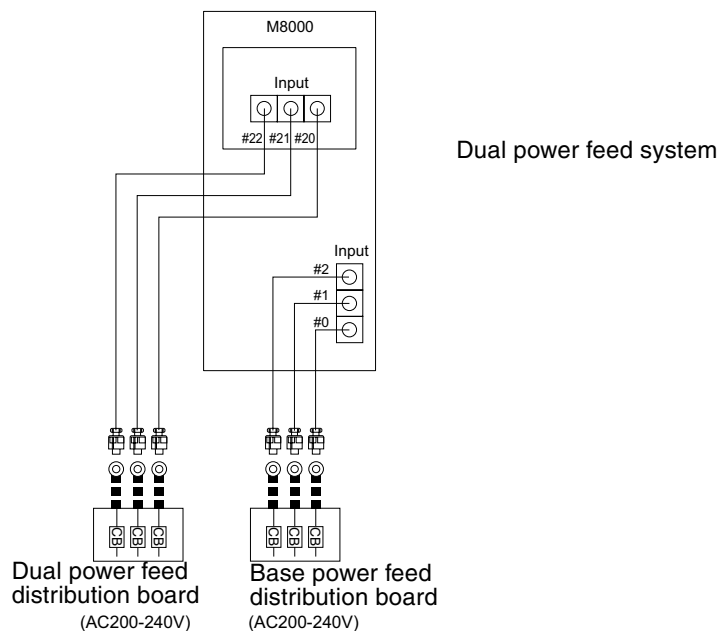


FIGURE 3-4 Single-Phase Power Supply Connections (SPARC Enterprise M8000 Server)

Note – The base and dual power feeds must be connected to different AC power supplies.

Note – To connect power cables for this system directly to your power distribution board, the power cables must be connected on a one-to-one basis as shown in the above figure.

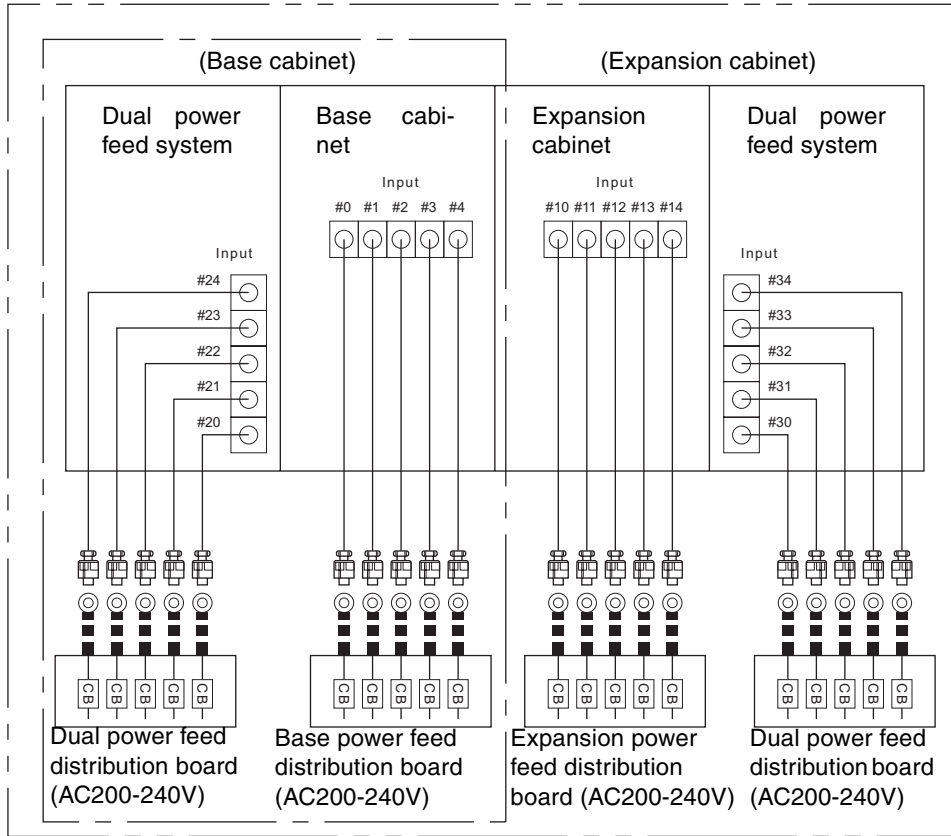


FIGURE 3-5 Single-Phase Power Supply Connections (SPARC Enterprise M9000 Server)

Note – The base and dual power feeds must be connected to different AC power supplies.

Note – To connect power cables for this system directly to your power distribution board, the power cables must be connected on a one-to-one basis as shown in the above figure.

3.4.1.2 Power Cable Connection Specifications

TABLE 3-8 lists specifications for single-phase power supply connections.

The SPARC Enterprise M8000/M9000 servers are equipped with the required number of single-phase power cables.

TABLE 3-8 Specifications (Single-Phase Power Supply Connections) (1 of 3)

Name	Destination	Power cable length ¹	Plug geometry	Number of plugs	Outlet in facility
SPARC Enterprise M8000 server	Japan	3.0m (9.8 feet)	30A-250V 3P, locking type (NEMA L6-30R)	3 (single power feed) 6 (dual power feed)	30A-250V 3P, locking type (NEMA L6-30R) Embedded type: 3320-L6 <American Denki> Exposed type: 3321-L6 <American Denki>
		3.0m (9.8 feet)	Parallel 2P+E (conforming to NEMA5-15P)	1 (FST)	15A-125V (conforming to NEMA5-15R)
	North America General overseas	3.0m (9.8 feet)	NEMA L6-30P	3 (single power feed) 6 (dual power feed)	NEMA L6-30R (North America only)
	Europe	3.0m (9.8 feet)	EN60309 (32A)	3 (single power feed) 6 (dual power feed)	EN60309 (32A)



TABLE 3-8 Specifications (Single-Phase Power Supply Connections) (2 of 3)





Name	Destination	Power cable length ¹	Plug geometry	Number of plugs	Outlet in facility
SPARC Enterprise M9000 server	Japan	3.0m (9.8 feet)	30A-250V 3P, locking type (NEMA L6-30R)	(Base cabinet) 5 (single power feed) 10 (dual power feed) (Base cabinet + expansion cabinet) 10 (single power feed) 20 (dual power feed)	30A-250V 3P, hook type, locking (NEMA L6-30R) Embedded type: 3320-L6 <American Denki> Exposed type: 3321-L6 <American Denki>
		3.0m (9.8 feet)	Parallel 2P+E (conforming to NEMA5-15P)	1 (FST)	15A-125V (conforming to NEMA5-15R)
					
North America General overseas	North America General overseas	3.0m (9.8 feet)	NEMA L6-30P ²	(Base cabinet) 5 (single power feed) 10 (dual power feed) (Base cabinet + expansion cabinet) 10 (single power feed) 20 (dual power feed)	NEMA L6-30R (North America only)
					
					

TABLE 3-8 Specifications (Single-Phase Power Supply Connections) (3 of 3)

Name	Destination	Power cable length ¹	Plug geometry	Number of plugs	Outlet in facility
SPARC Enterprise M9000 server	Europe	3.0m (9.8 feet)	EN60309 (32A)	(Base cabinet) 5 (single power feed) 10 (dual power feed) (Base cabinet + expansion cabinet) 10 (single power feed) 20 (dual power feed)	EN60309 (32A) 

1 The power cable length is the length from the cable port on the cabinet to the outlet plug.

2 Plugs for the North American and general overseas markets must be replaced locally in accordance with local electrical standards as required. Make sure that a qualified electrical engineer performs the replacement work.

3.4.1.3 Three-Phase Power Supply

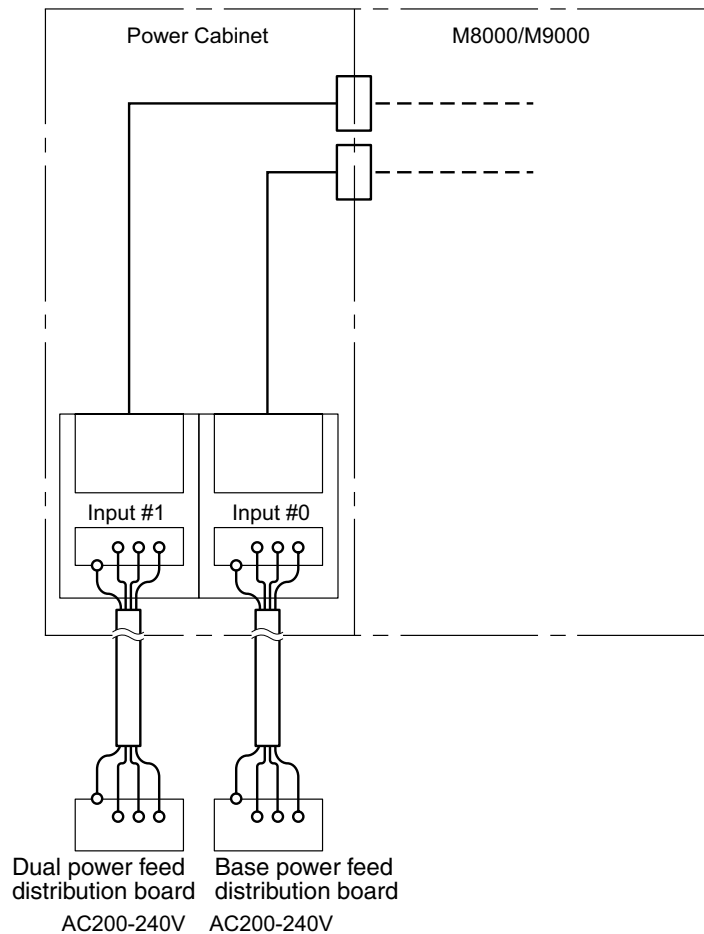


FIGURE 3-6 Three-Phase Delta Power Supply Connections

Note – The basic power bus and dual system power bus must be connected to different AC power supplies.

Power Cable Connection Specifications

Part of the local electrical work for three-phase power feed is connecting the power cable from the power distribution board directly to the Power Cabinet terminal board.

Make sure that the facility administrator or a qualified electrical engineer performs the electrical work.

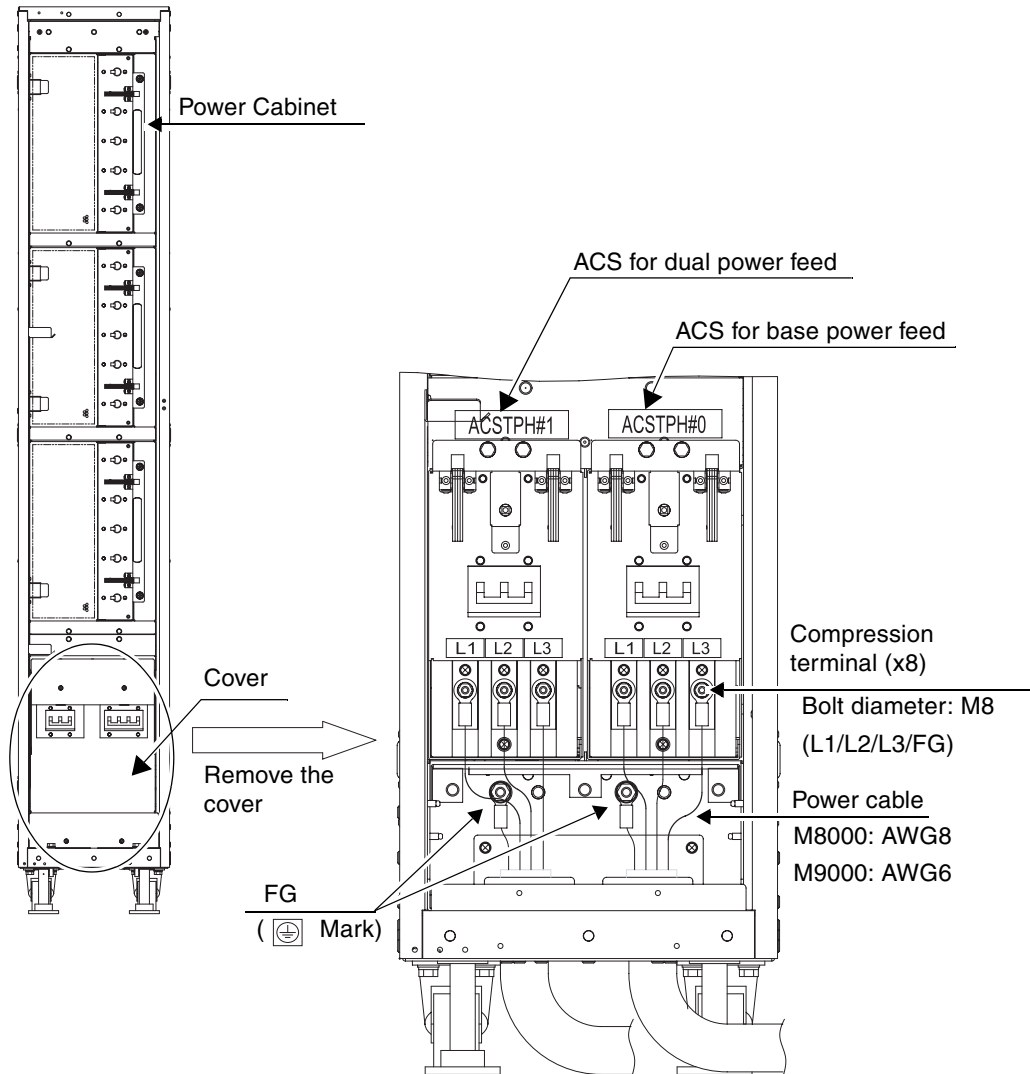


FIGURE 3-7 Three-Phase Delta Power Supply Connections

3.4.1.4 Three-Phase Star Power Supply

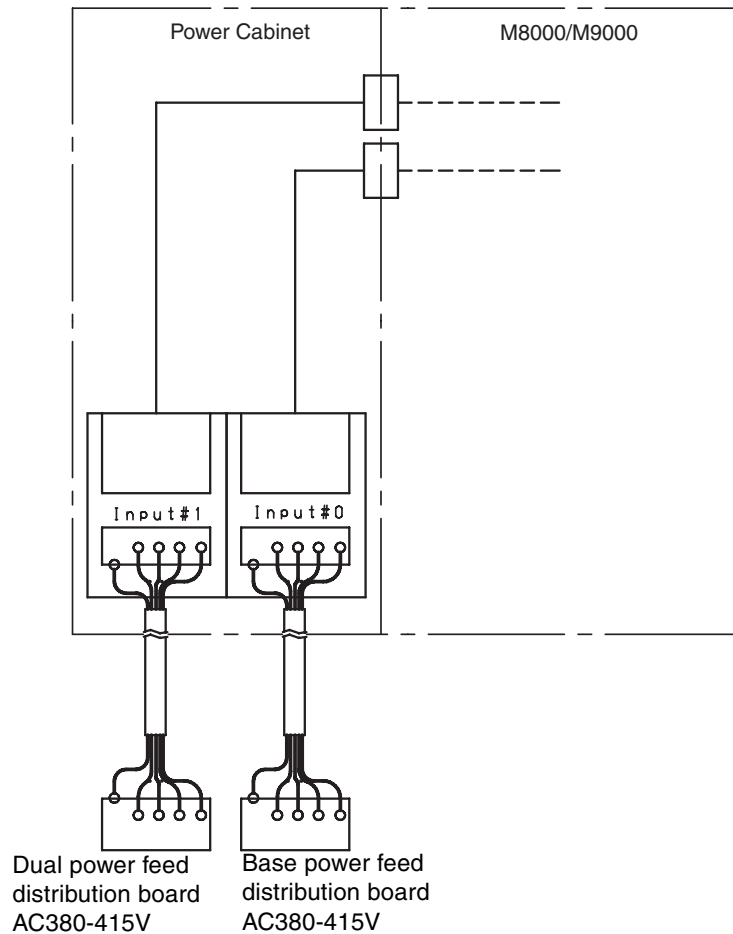


FIGURE 3-8 Three-Phase Star Power Supply Connections

Note – The basic power bus and dual system power bus must be connected to different AC power supplies.

Power Cable Connection Specifications

Part of the local electrical work for three-phase power feed is connecting the power cable from the power distribution board directly to the Power Cabinet terminal board.

Make sure that the facility administrator or a qualified electrical engineer performs the electrical work.

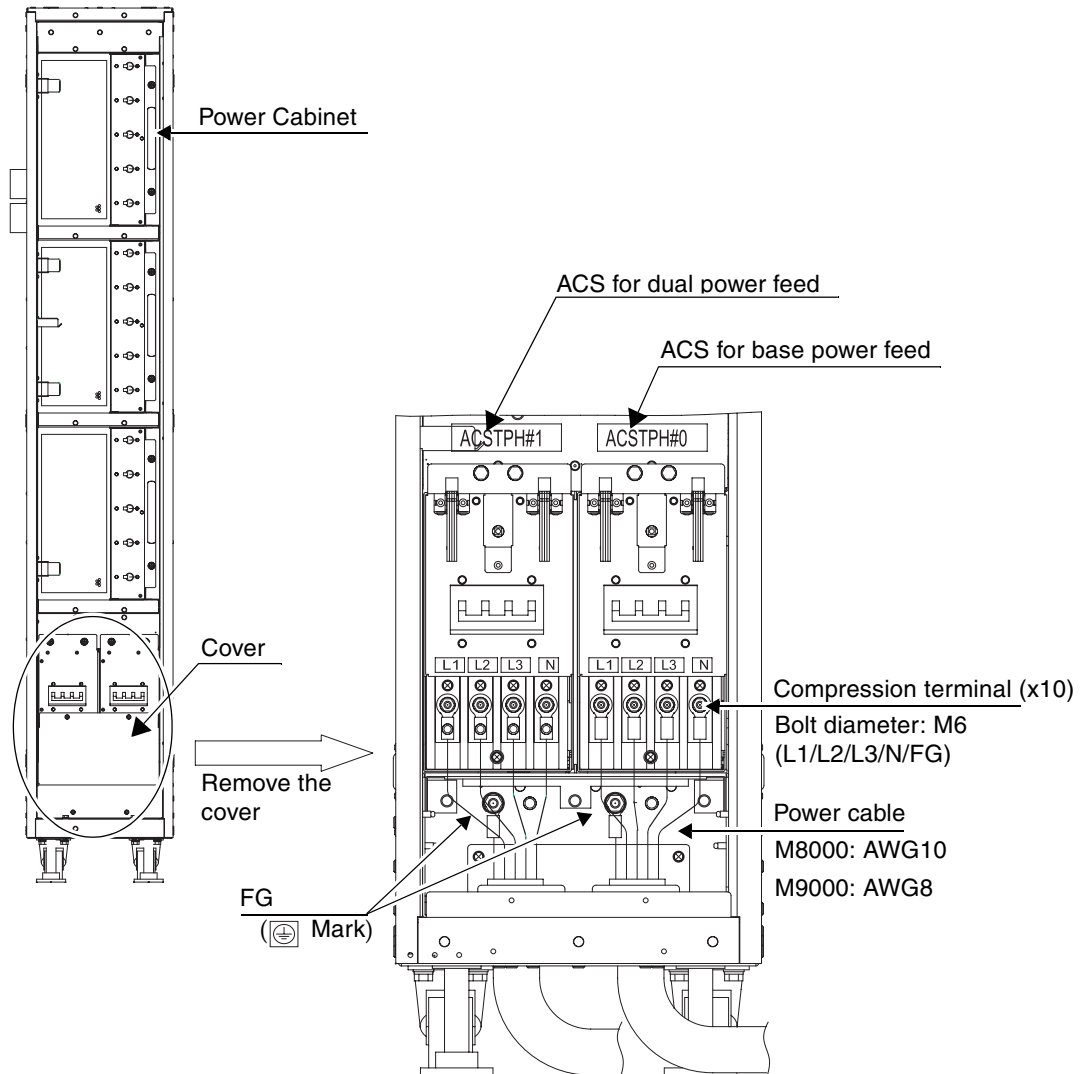


FIGURE 3-9 Three-Phase Star Power Supply Connections

3.4.2 Circuit Breaker Capacity and Characteristics

As a condition for maintaining the linked protection that would trip a system circuit breaker before a circuit breaker in your distribution panel in the SPARC Enterprise M8000/M9000 servers, the circuit breakers in your distribution panel must have the characteristic described below. Use circuit breakers that have these characteristics in your distribution panel.

3.4.2.1 Circuit Breaker Capacity of Customer Panel Board

TABLE 3-9 Circuit Breaker Capacity of Customer Panel Board

Power supply input	Name of device	Circuit breaker capacity of customer panel board (Japan/North America/Oversea in general)	Capacity of customer panel board (Europe)
Single phase (AC200-240V)	SPARC Enterprise M8000 server	30A	32A
	SPARC Enterprise M9000 server	30A	32A
3 phase delta (AC200-240)	SPARC Enterprise M8000 server	50A	50A
	SPARC Enterprise M9000 server	80A	80A
3 phase star (AC380-415V)	SPARC Enterprise M8000 server	30A	30A
	SPARC Enterprise M9000 server	50A	50A

3.4.2.2 Blockade Character of Circuit Breaker

The blockade character of the circuit breaker is long-time delay type. Use a circuit breaker which is equivalent to, or slower than, blockade character D (IEC898 or DIN0651 part II) of [FIGURE 3-10](#).

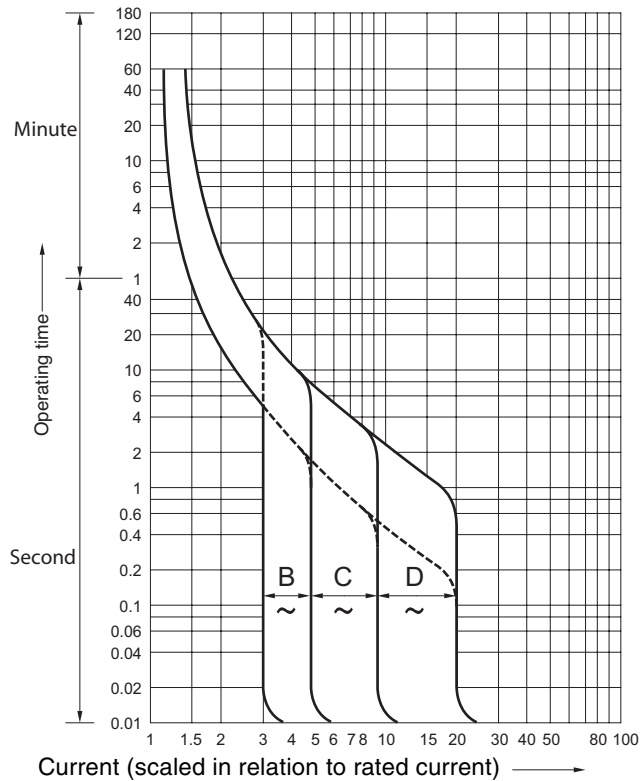


FIGURE 3-10 Circuit Breaker Characteristics of Customers' Power Distribution Boards

3.4.3 Grounding

Grounding for Single-phase Power Supply

SPARC Enterprise M8000/M9000 servers used with a single-phase power supply ships with a grounded (three-wire) power cable.

The power cable must always be connected to a power outlet that has a grounding receptacle.

Grounding for Three-phase Power Supply

The power cable is not supplied with three-phase power supply SPARC Enterprise M8000/M9000 servers.

Since different grounding methods are used depending on the building where the system is installed, check the grounding type and refer to related documents (e.g., IEC documents) in order to use the correct grounding method. Make sure that the facility administrator or a qualified electrical engineer verifies the grounding method for the building and performs the grounding work.

Abbreviations

A

ACS	AC Section
ACSTPH	ACS Three-Phase

B

BP	Backplane
BUI	Browser User Interface

C

CMB	CPU Memory Board
CMU	CPU/Memory Board Unit
CLI	Command Line Interface
CLKU	Clock Control Unit
CPUM	CPU Module

D

DAT	Digital Audio Tape
DDC	DC to DC Converter
DPF	Dual Power Feed
DR	Dynamic Reconfiguration

E

EMI	Electromagnetic Interference
-----	------------------------------

F

FAN	FAN Unit
FRU	Field Replaceable Unit

H

HDD	Hard disk drive
-----	-----------------

I

IOB	I/O Board
IOU	I/O Unit
IOUA	IOU Onboard Device Card_A

M

MAC	Memory Access Controller
MEDBP	Media Backplane

O

OBP	OpenBoot PROM
OPNL	Operator Panel

P

PCICS	PCI Cassette
PCI-ES	PCI-Express Short
PFC	Power Factor Correction
PHP	PCI Hot Plug
POST	Power-On Self-Test
PSU	Power Supply Unit

R

RCI	Remote Cabinet Interface
RDPF	Rack-mountable Dual Power Feed

S

SAS	Serial Attached SCSI
SATA	Serial ATA (Advanced Technology Attachment)
SC	System Controller
SNSU	Sensor Unit
SWBP	Switch Backplane

T

TAPEU	Tape drive unit
--------------	-----------------

U

UPS	Uninterruptible Power Supply
------------	------------------------------

X

XBU	Crossbar Unit
XSCF	eXtended System Control Facility
XSCFU	eXtended System Control Facility Unit

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